Installation and user technical manual (Page 002) EN

Translated from FRA original version (351260B-revision02-FR)

Operator modules

Transceivers

Charger and Charger support

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Thank you for choosing JAY Electronique for your radio control system. Your configuration has been defined for your application to ensure easy use and maintenance while providing the highest level of safety.

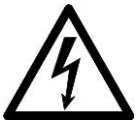
The various components forming your **JAY Electronique** radio control system are designed to meet the safety requirements of the currently applicable and draft standards, and are compliant with the European directives (see section « *CE statement of compliance* »).

For all questions concerning installation or use of your radio control system, contact our «**Customer Technical Support**» service:

Monday to Friday

Tel : 04.76.41.44.00
Fax : 04.76.41.44.44
Email : support.technique.client@jay-electronique.fr

Terms and symbols used in this manual :

Control component	**Refers to any control component of the operator module used by the operator to radio control the Transceiver by radio link (such as : *single-action pushbuttons, double-action pushbuttons, rotary switches, selectors, joysticks, proportional toggle switches,* etc.)**
	On Operator Module : **Black pushbutton with diamond symbol: « tab » navigation function**
	On Operator Module : **Black pushbutton with square symbol : « increment » function**
	On Operator Module : **Green pushbutton with round symbol : « validate » function**
	Exclamation point in triangle. This symbol indicates that you must observe the operating and maintenance instructions given in the manual.
	**Lightning in triangle. This symbol is used to warn you of a hazardous un-insulated voltage. This voltage can cause a dangerous electrical shock. The symbol indicates that the equipment must not be opened (such as the Transceiver unit) when powered up.**

1 General safety rules and precautions

A radio control system is considered as a machine control device and as a safety component used to stop a machine as specified by the EEC Machinery Directive. All applicable rules must therefore be observed to ensure safe, correct operation of such devices.

The use of the radio control system enables the operator to better focus on his work as it allows him to choose his observation position which is only limited by safety considerations (example: no one should be standing under a load).
The radio remote control completes and enhances the classic safety circuits (emergency stop circuits).

- **To ensure safe use, the instructions given in this manual must be strictly observed.**
- The operator must be appropriately trained and certified to operate machines by radio control.
- The operator must have uninterrupted visibility of the manoeuvre which he is performing. When the operator's direct field of view is inadequate, the lifting machinery must be equipped with auxiliary devices to improve visibility.
- When several machines are being moved simultaneously, the equipment must be fitted out to limit to consequences of a possible collision
- To avoid any risks of electrocution, don't open the Transceiver housing when powered. The opening of the housing must be done by ensuring that the power supply cables and control cables are out of voltage.
- Never leave the operator module unattended in any haphazard location, even though it is equipped with a “Standby Mode” function which automatically cuts out the system.
- Never leave the operator module to sunlight (eg vehicle windscreens), or near a heat source.
- If several radio controls are used at the same site, different radio frequencies should be used.
- In the event of a malfunction, immediately shut down the installation by pressing the stop palmswitch on the operator module and remove the battery.
- Service your equipment and perform all the periodic checks as may be required by the intensity with which your equipment is used. Follow necessarily the instructions of cleaning described in the chapter «***Inspecting and servicing***».

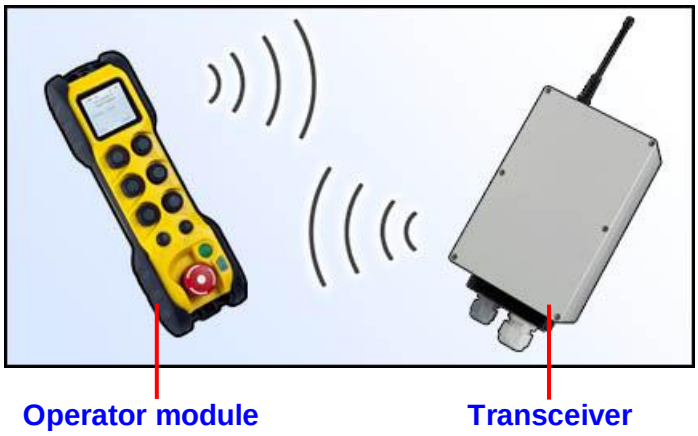
2 Description and operating principle

A radio control assembly is formed by two components: an **operator module** (for example : « **Gama** » type) and a **transceiver** (for example : « **Elio** » type).

The **operator module** transmits the commands to the **transceiver** which decodes the commands and puts them into action in accordance with its outputs (relay, analogue or BUS outputs).

The radio link between the **operator module** and the **transceiver** is bidirectional ; this allows return of **transceiver** inputs/outputs information used for radio control.

Example :



The **transceiver** contains the configuration of the **operator module** corresponding to the application (also referred to as the « application memory »). A simple association procedure is required to allow the **operator module** to recover the application configuration.

The link between the two elements is ensured through an **« identity code »** (unique, frozen code, stored in the **transceiver**).

The **operator module** is formed by :

- a display screen
- a safety stop palmswitch
- a green pushbutton (for « On » and « Validate » functions)
- a black « tab » navigation pushbutton
- a black « increment » pushbutton
- control components corresponding to the configuration required for the application (such as : single and double-action pushbuttons, rotary switches, selectors, joysticks, etc.)

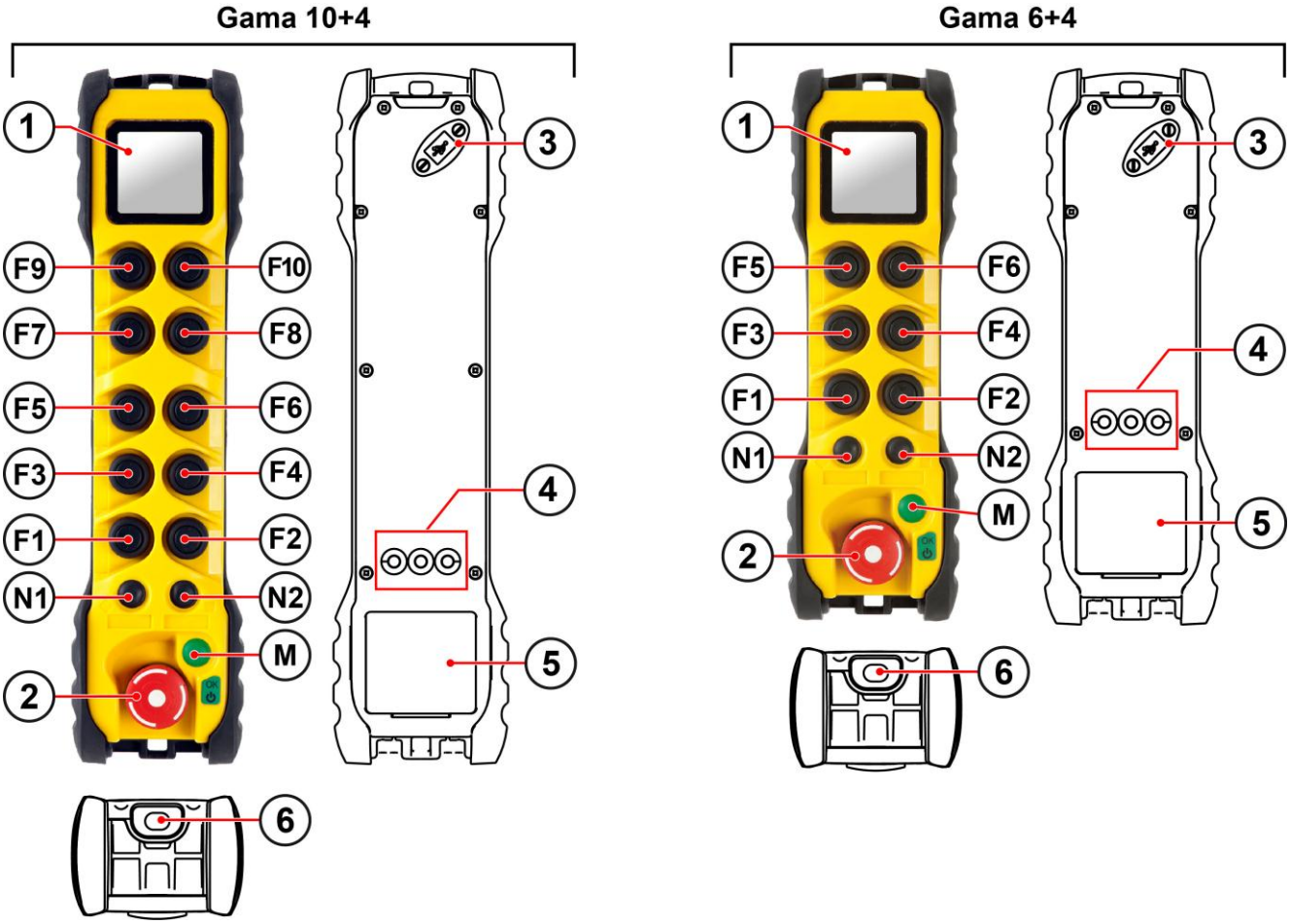
The **Transceiver** is formed by :

- two safety relays
- an « On » relay
- inputs/outputs corresponding to the configuration required for the application.

3 Operator module

3.1 General view of operator modules

3.1.1 Gama operator modules

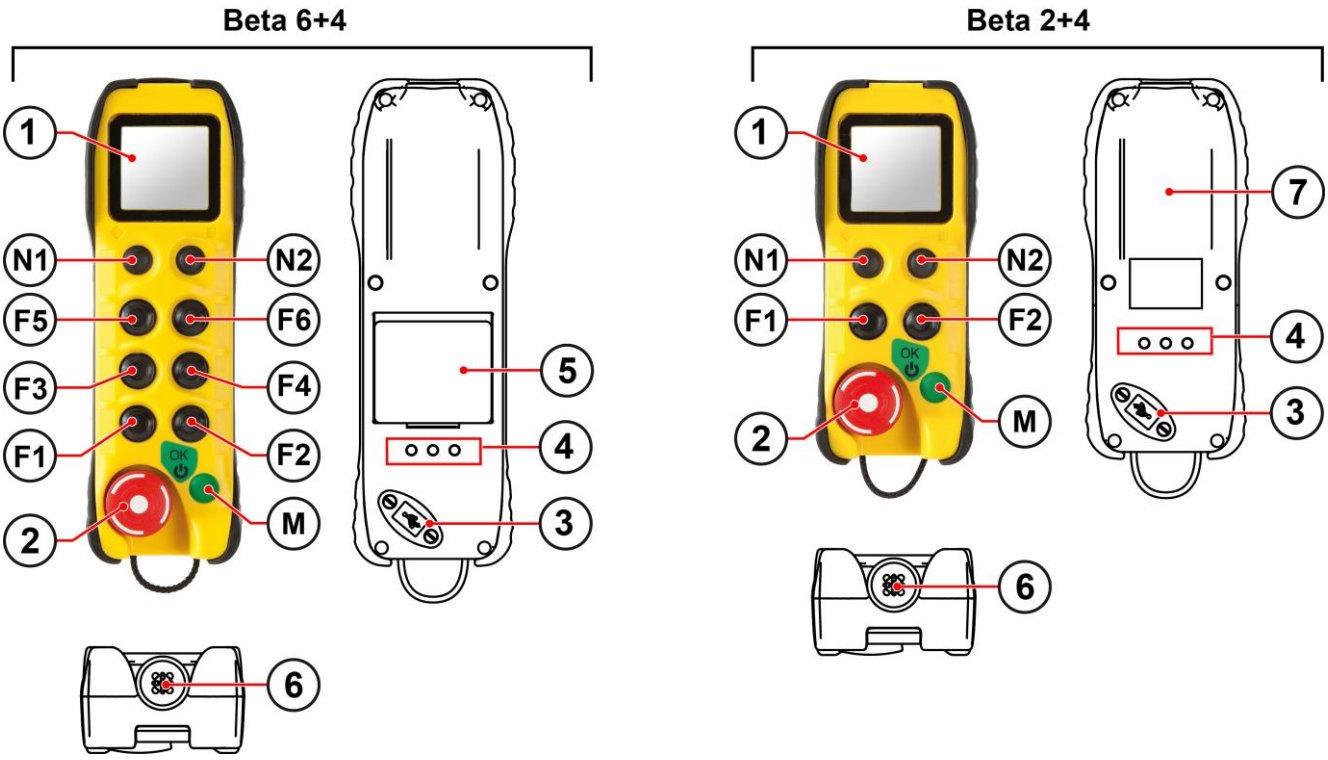


1	Screen
2	Emergency stop palmswitch
3	Access to the USB connection
4	Contacts for recharging battery (support charger)
5	Plug-in battery
6	IR cell (optional "startup by IR validation" / "operator detection")

F1 to F10	Function buttons with single or double action

N1	Browsing pushbutton « Tab »
N2	Input pushbutton « Increment »
M	Pushbutton « ON » and « Validation »

3.1.2 Beta operator modules

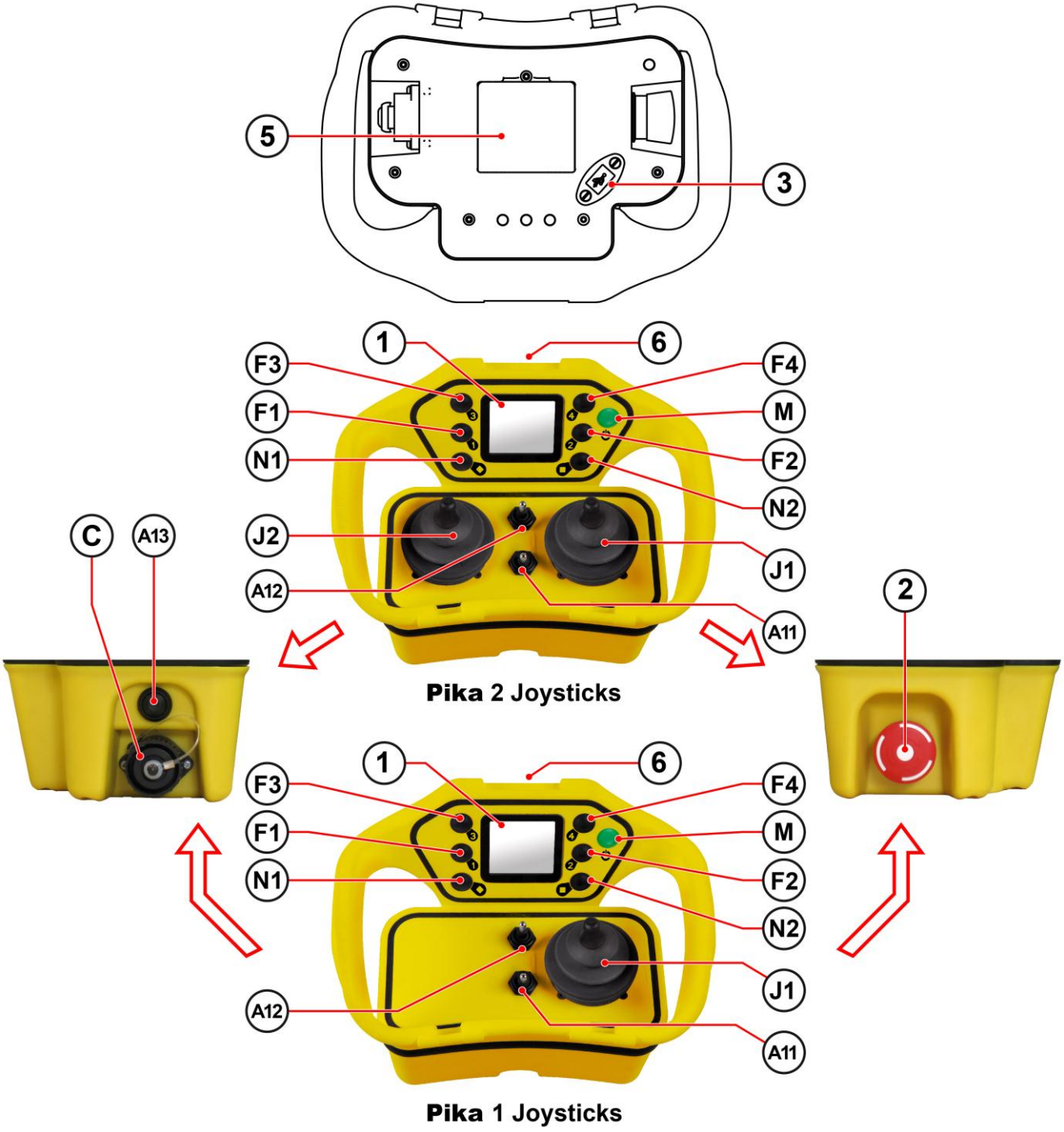


1	Screen
2	Emergency stop palmswitch
3	Access to the USB connection
4	Contacts for recharging battery (support charger)
5	Plug-in battery
6	Location for optional element (IR cell, antenna etc. ...)
7	Internal battery

F1 to F6	Function buttons with single or double action

N1	Browsing pushbutton « Tab »	
N2	Input pushbutton « Increment »	
M	Pushbutton « ON » and « Validation »	

3.1.3 Pika operator modules

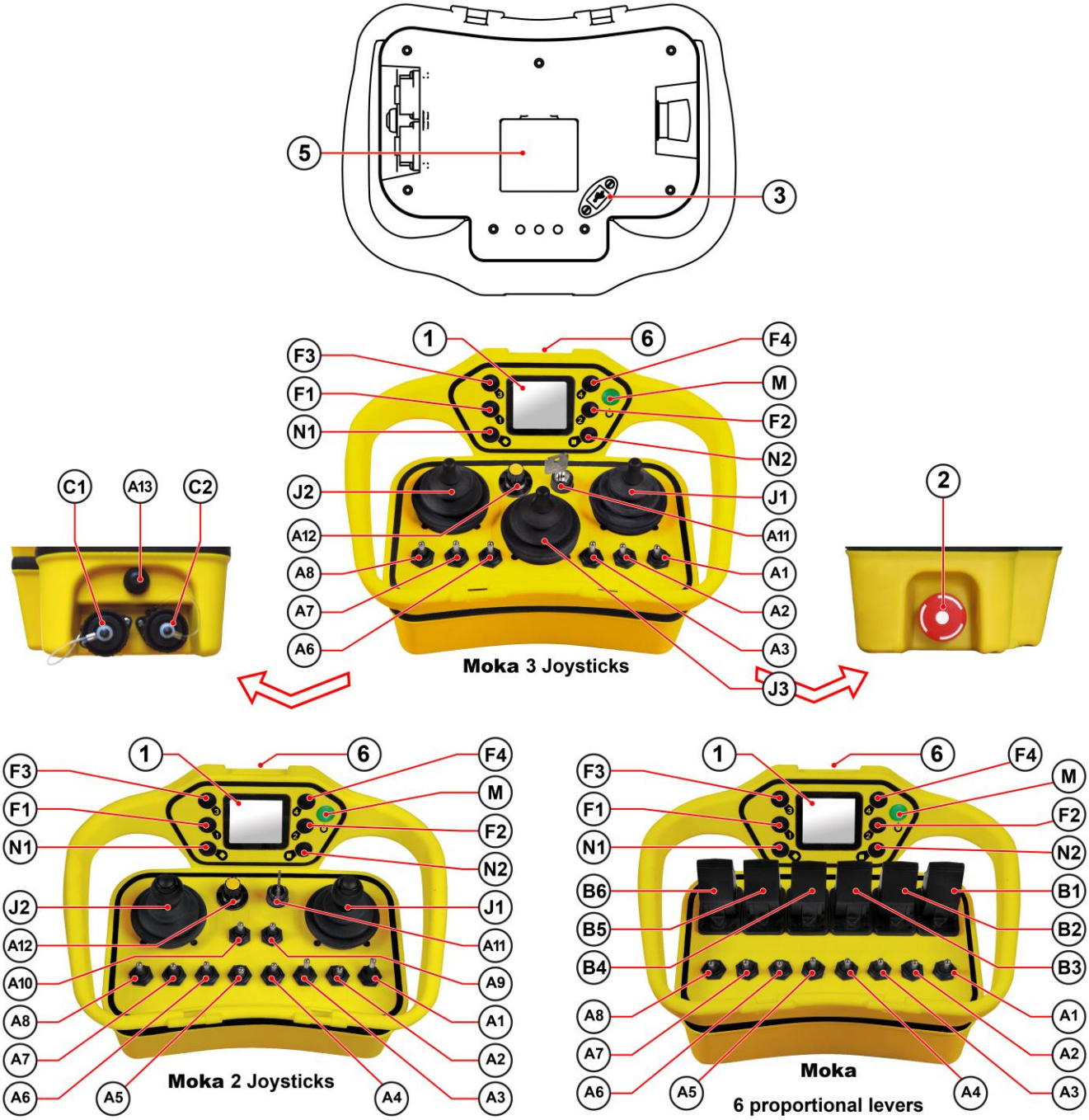


1	Screen
2	Emergency stop palmswitch
3	Access to the USB connection
5	Plug-in battery
6	IR cell (optional "startup by IR validation" / "operator detection")
A13	Location for optional element : Pushbutton
C	Location for optional element : Industrial connector

N1	Browsing pushbutton « Tab »
N2	Input pushbutton « Increment »
M	Pushbutton « ON » and « Validation »

F1 to F4	Function buttons with single action
A11, A12	Auxiliary control devices (selector, push button, rotary switch etc. ...)
J1, J2	Joysticks (optional validation pushbutton)

3.1.4 Moka operator modules



1	Screen
2	Emergency stop palmswitch
3	Access to the USB connection
5	Plug-in battery
6	IR cell (optional "startup by IR validation" / "operator detection")
A13	Location for optional element : Pushbutton
C1	Location for optional element : Industrial connector
C2	Location for optional element : Industrial connector

N1	Browsing pushbutton « Tab »
N2	Input pushbutton « Increment »
M	Pushbutton « ON » and « Validation »

F1 to F4	Function buttons with single action
A1 to A12	Auxiliary control devices (selector, push button, rotary switch etc. ...)
J1 à J3	Joysticks (optional validation pushbutton)
B1 à B6	Toggle switches

3.2 Instructions before use

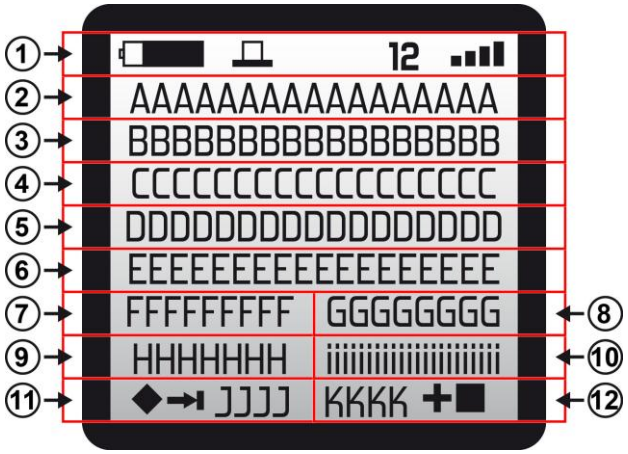
- **On reception of the product**, you must completely charge the battery. To charge the battery, use the battery charger alone or the support charger of the operator module. Refer to the section « ***Chargers and Charger supports*** » for information concerning use.
- **The installer must** check that the control components of the operator module are properly matched up with the control outputs for the application using the « ***Configuration sheet*** » supplied with the radio-control system (PDF file on a USB key-card).

3.3 Using the screen and navigating in the menus

3.3.1 Information displayed by operator module screen

The operator module screen is used to display text and pictograms to facilitate use of the equipment.

During use, the screen has 12 display areas :



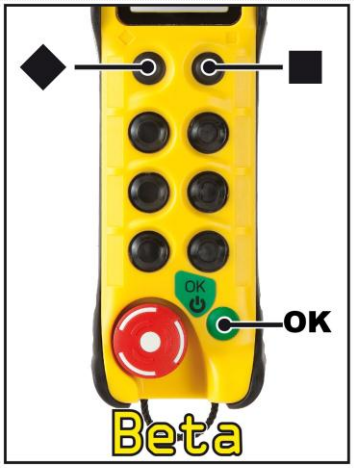
Area	Description
1	Information relative to radio control system status: = « Battery level » pictogram = « Control component position status » pictogram 12 = Radio channel currently being used = Quality of radio link between Operator module and Transceiver
2	Name of radio controlled equipment
3	Name of operating mode (line No. 1)
4	Name of operating mode (line No. 2) or transceiver information No. 1 return
5	Transceiver information No. 1 or No. 2 return
6	Transceiver information No. 2 or No. 3 return
7	Name of function or selection **No. 5**
8	Name of function or selection **No. 6**
9	Name of function or selection **No. 3**
10	Name of function or selection **No. 4**
11	Name of function or selection **No. 1** Display of pictogram when required by menus
12	Name of function or selection **No. 2** Display of pictogram when required by menus

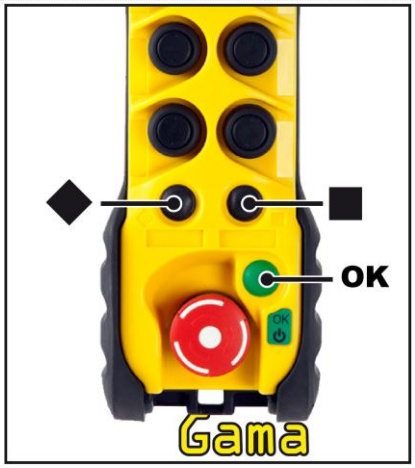
3.3.2 Screen user interface

To navigate in the various menus of the screen, use the black « Tab » navigation pushbutton (diamond pictogram ◆⇥).

Numerical and alphabetical inputs are made using the black « Increment » pushbutton (square pictogram +■).

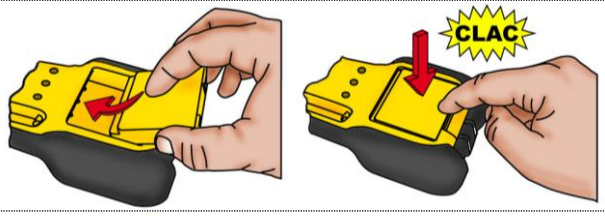
To select menus or validate data, use the green validate pushbutton (round pictogram ●).



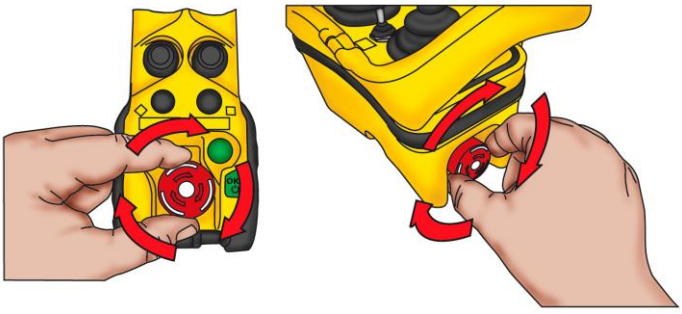


3.4 Commissioning the operator module

1 Place a charged battery in the operator module unit or make sure that the battery in the operator module is charged (for Beta 2+4 model).



2 Unlock the emergency stop palmswitch.



3 Press and release the green « On » pushbutton .

4 The operator module home screen should display the following information.

5 Description of menus proposed :

Start : This menu is used to generate an installation startup command to the Transceiver.
IMPORTANT : the association procedure must be completed beforehand.

Association : This procedure is carried out during commissioning to associate the Operator module to the Transceiver(s).

Configuration : This menu is used to configure certain settings on the radio control system.

6 Before any use, perform the « **ASSOCIATION** » procedure detailed in the next section « ***Association function*** ».

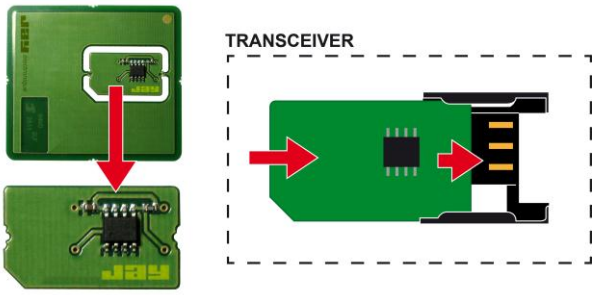
3.5 « Association » function (association with a Transceiver)

The « **Association** » function is used to search for and identify the Transceivers located in the vicinity of the operator module and to select one from the list displayed. This function is used to configure the operator module with the application parameters contained in the Transceiver.

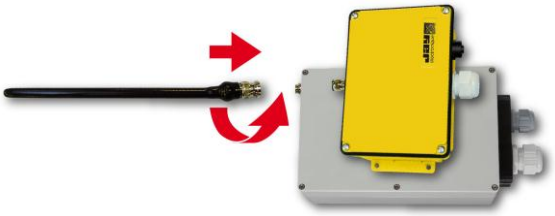
Note : During the Transceiver search phase, the transmit range of the Operator module is reduced to prevent unintentional selection of a Transceiver located outside the user's view.

1 **Insert the SIM card in the Transceiver.**

(See section « *Transceiver* » for more information concerning the SIM card.)



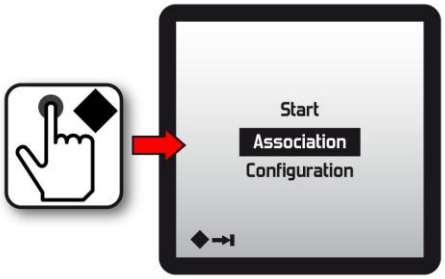
2 **Connect the antenna into the BNC connector on Transceiver**



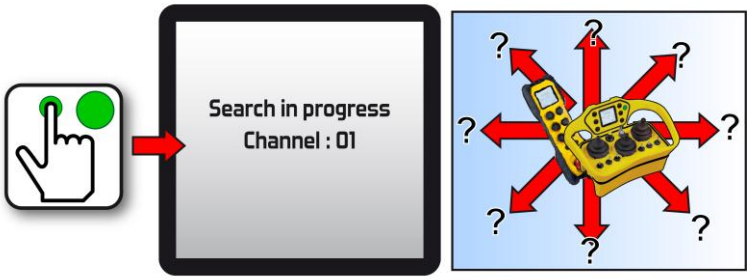
3 **Connect the Transceiver to the power supply and Switch on the Transceiver.**

(See section « *Transceiver* » for more information concerning the electrical wiring)

4 **Switch on the operator module and select the « Association » menu on the home screen**



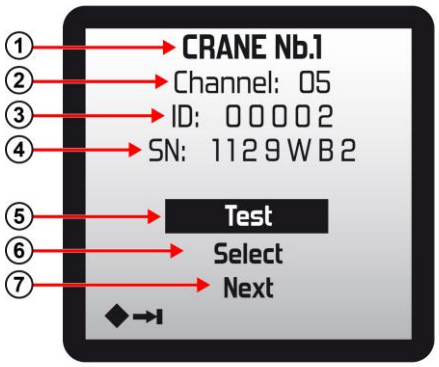
5 **Press the green validate pushbutton (●) to initiate the transceiver search.**



The operator module will search for transceivers located in the vicinity on all the available radio channels

3.5.1 Searching for Transceiver

When a Transceiver has been found and identified, the operator module screen indicates :



1) The name of the radio-controlled equipment

2) The radio channel used by the radio-controlled application

3) The identity code used for the application

4) The serial number of the Transceiver identified

5) Choose « **Test »** to test the Transceiver identified before you make a definitive association. This action will generate an activation command to the relay associated to the green validate pushbutton , as :

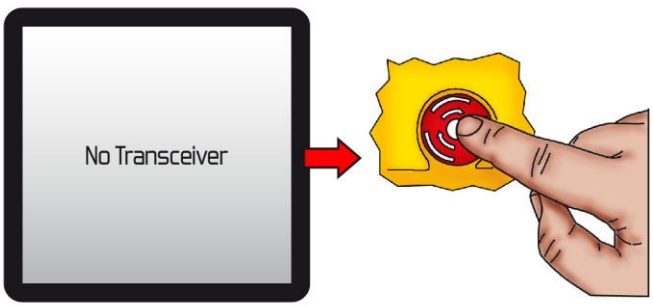
- Transceiver **Alto :** the relay **RY** is activated
- Transceiver **Elio :** the relay **RM** is activated
- Transceiver **Timo :** the green indicator light **LD2** « RADIO » comes on

Note : A light or sound warning device should be connected to the output to facilitate the Transceiver test.

6) Choose « **Select »** to access the menu used to associate the Operator module with the Transceiver identified (see next section « ***Associating a Transceiver to an Operator module*** »)

7) Choose « **Next »** to continue the search for the Transceiver on the other radio channels.

If no Transceiver has been found or identified, the « **No Transceiver Module** » message displayed. You must press the emergency stop palmswitch.



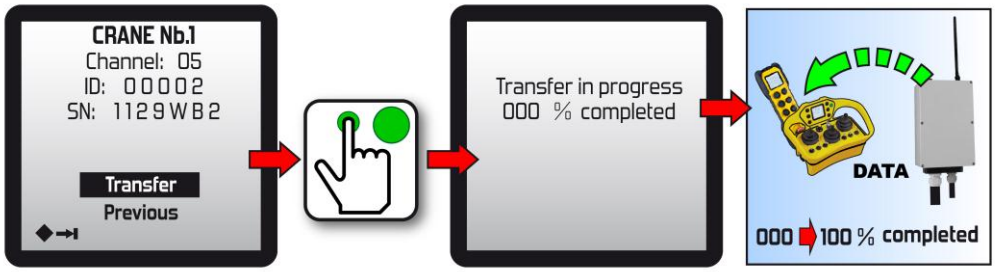
3.5.2 Associating a Transceiver to an Operator module

Once the Transceiver search has been successfully completed (see previous section), use the « **Select** » menu to associate the Operator module with the Transceiver.

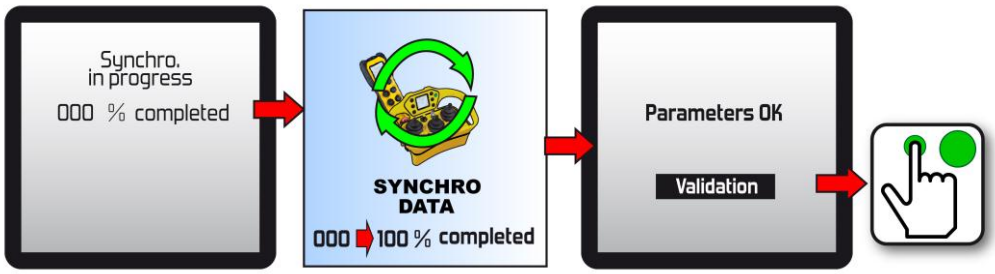
Choose « **Previous** » to return to the Transceiver search function.

Chose « **Transfer** » to initiate the association procedure during which the application configuration parameters contained in the Transceiver are transmitted by radio to the Operator module.

IMPORTANT : Do not switch off the Transceiver power supply during this step.



The operator module will then Synchronise the data saved in the operator module. Once the check is completed, if the procedure has taken place correctly, the « **Parameters OK** » message is displayed and by choosing « **Validation** », the operator module power supply is switched off :



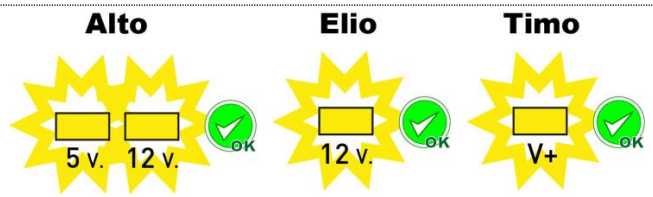
Note : The maximum time required for an association is around 3 minutes.

3.6 Using the radio control system

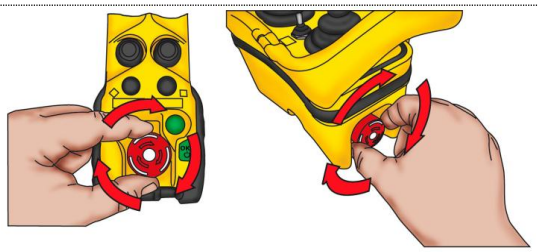
3.6.1 Starting up the radio control system

IMPORTANT : Before using the system, make sure the Operator module has been associated with a Transceiver ; proceed as instructed in the « ***Association Function*** » section.

1 **Switch on the Transceiver**



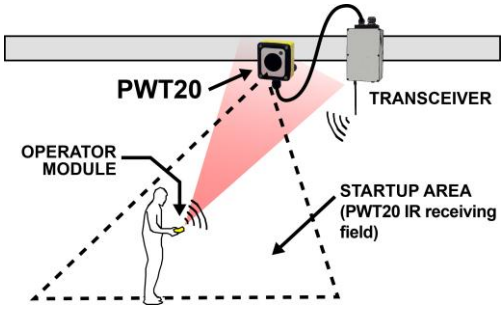
2 **Unlock the emergency stop palmswitch.**



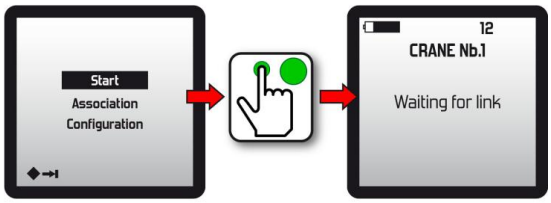
3 **Press and release the green « On » pushbutton .**

4 **If the radio control system is equipped with feature « *startup by infrared validation* », the operator module must be placed in the « startup area » and must point in the direction of PWT20 IR module(s).**

(See section « *Option : Startup by IR validation feature* »)

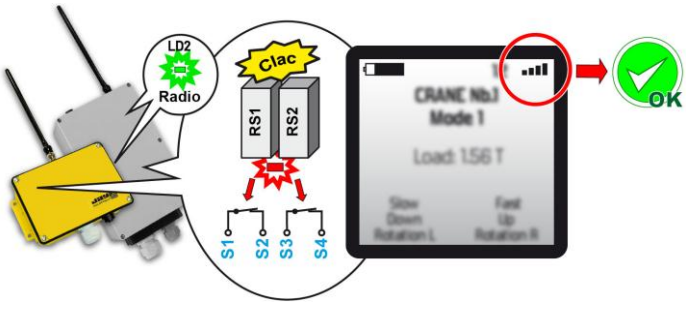


5 **Select the « Start » menu on the home screen and press the green « On » pushbutton .**



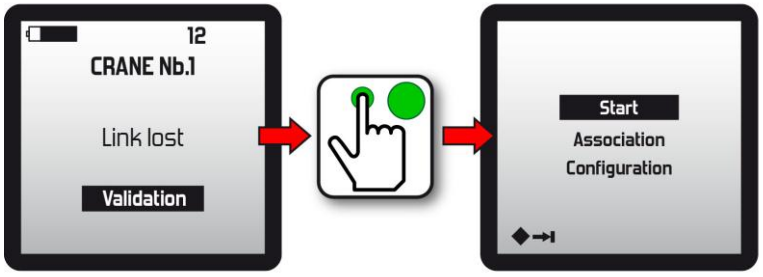
6 **Once the link between the Operator module and the Transceiver has been set up, the safety relays of the Transceiver are activated (RS1 and RS2).**

The equipment can be radio-controlled.



If the radio link has not been established within 8 seconds, the following message is displayed:

Press the « **On** » validate button to return to the operator module home screen.

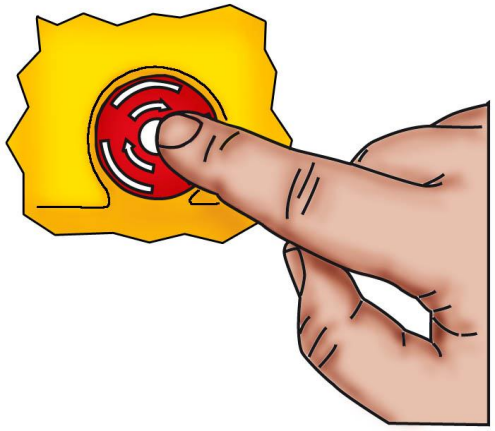


Note : During use, if no control component has been actuated over a certain period of time, the “Standby Mode” function is triggered, causing the operator module to stop and passive stopping of the Transceiver.

Refer to section « ***Operator module automatic stop function*** ».

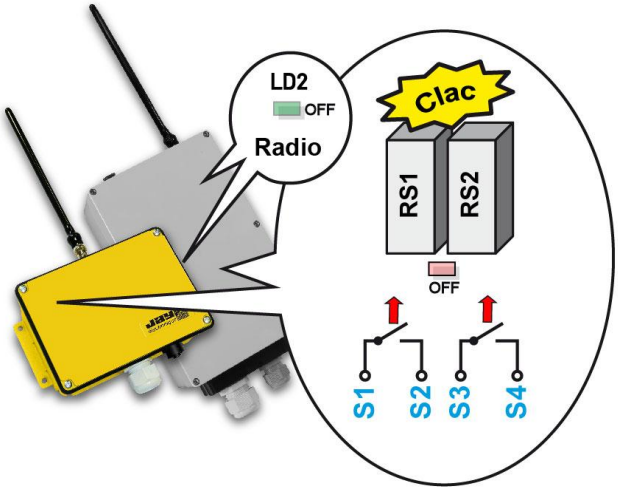
3.6.2 Stopping the operator module

1 **To fully stop the operator module, press the emergency stop palmswitch.**



2 **Before shutting down, the operator module generates an « active » priority stop command to the Transceiver (active stop).**

To reactivate the operator module after the emergency stop palmswitch has been pressed, perform the « Startup » procedure detailed in the previous section.



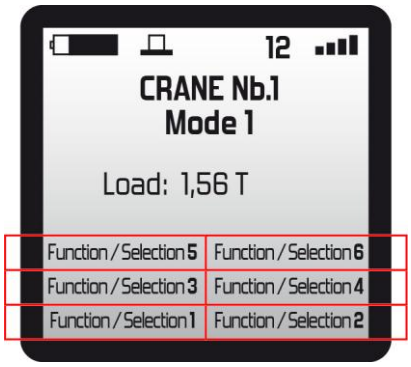
Note : The operator module can also be stopped by the « **Standby Mode** » and « **Deadman** » (optional) functions detailed in the section « ***Operator module automatic stop functions*** ».

3.6.3 Function selector

Depending on the applications and utilisation needs, certain pushbuttons on the operator module are configured to operate as function « **selectors** ».

Depending on the operator module, up to 6 selectors can be implemented.

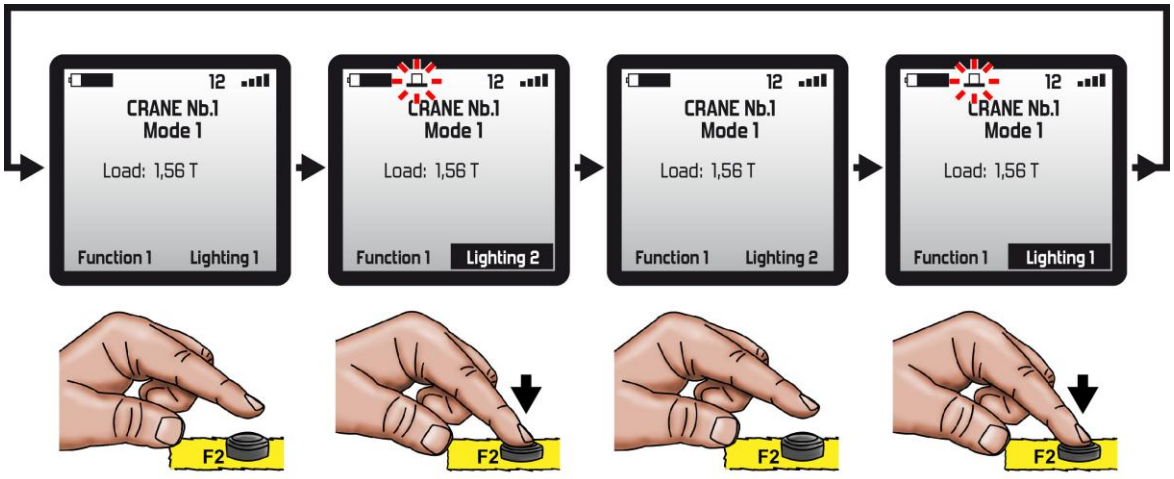
When a pushbutton on the operator module is used in « selector » mode, the function is the function shown on the screen in the “selection designation” areas.



Each time the « selector » pushbutton is pressed and released, the screen displays the next function and transmits it to the Transceiver.

Example :

Pushbuttons **F1** and **F2** of an operator module have been configured in selector mode. Below is the operating principle when pushbutton **F2** is pressed (sequential lighting control) :

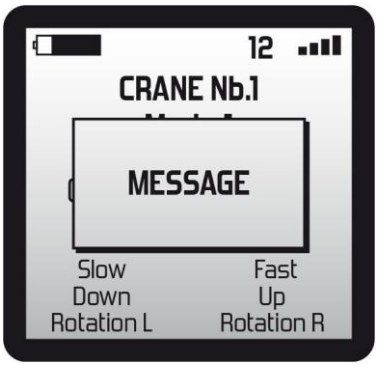


Note : The pushbuttons configured as selectors and the correspondence with the designation areas are indicated on the **configuration sheet** supplied with the radio control system.

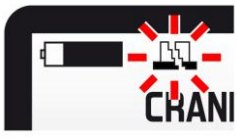
Note : The function and selection designations can be modified using the **iDialog** configuration software.

3.7 Alert messages

While using the operator module, alert messages or pictograms can appear on the screen. These messages are displayed to inform you on a given situation and to guide you in certain cases to re-establish operation.



List of messages :

Message or pictogram	Description	Display time
	The standby function is going to be activated since the operator module has not been used over a certain period of time.	**Momentary. This message appears for 30 seconds before automatic shutdown of the operator module**
	The battery level is low. The battery must be recharged or replaced.	**Momentary. This message appears several times before shutdown of the operator module (battery discharged).**
	The Transceiver is in « safety » mode. The safety relays have been deactivated.	**Permanent, up to reactivation of the Transceiver (by pressing the « On » button on the operator module).**
	A change of parameter could not be synchronised with the Transceiver (not acknowledged).	**Momentary.**
	Low radio link level between operator module and transceiver	**Momentary**
	**A fault has been detected on actuation of a control component**	**Each time the concerned control component is actuated**

Note 1 : All of the alarm messages can be cleared by pressing the « On » button on the operator module.

Note 2 : Certain messages can be modified using the **iDialog** software.

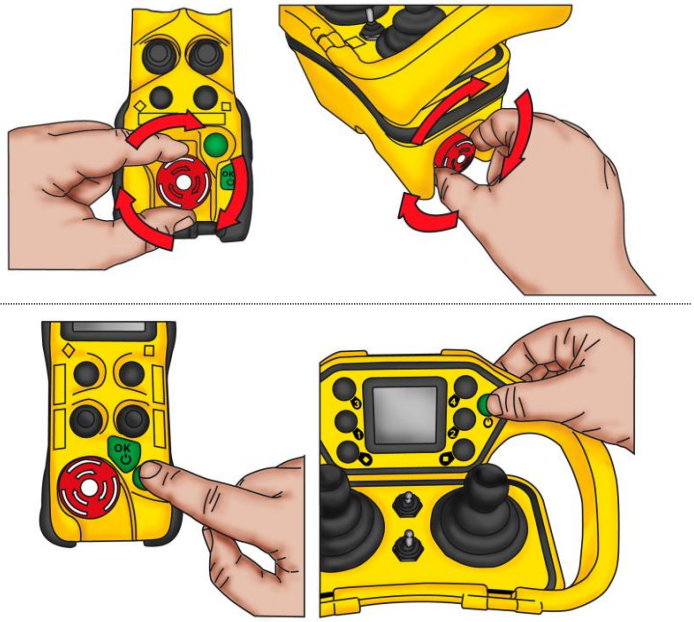
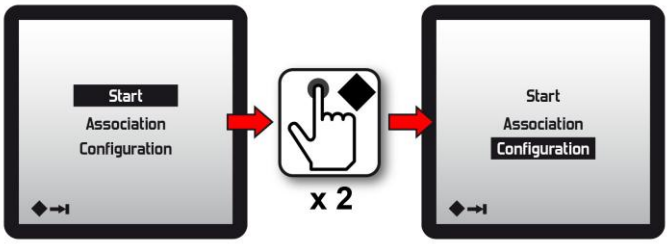
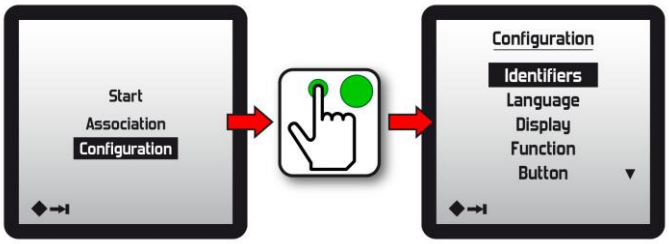
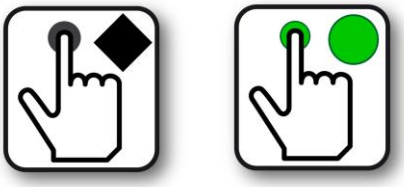
3.8 Configuration menu

The « **configuration** » menu is used to access the various configurations of the operator module and of the radio control system.

IMPORTANT : certain settings require shutdown of the Transceiver.

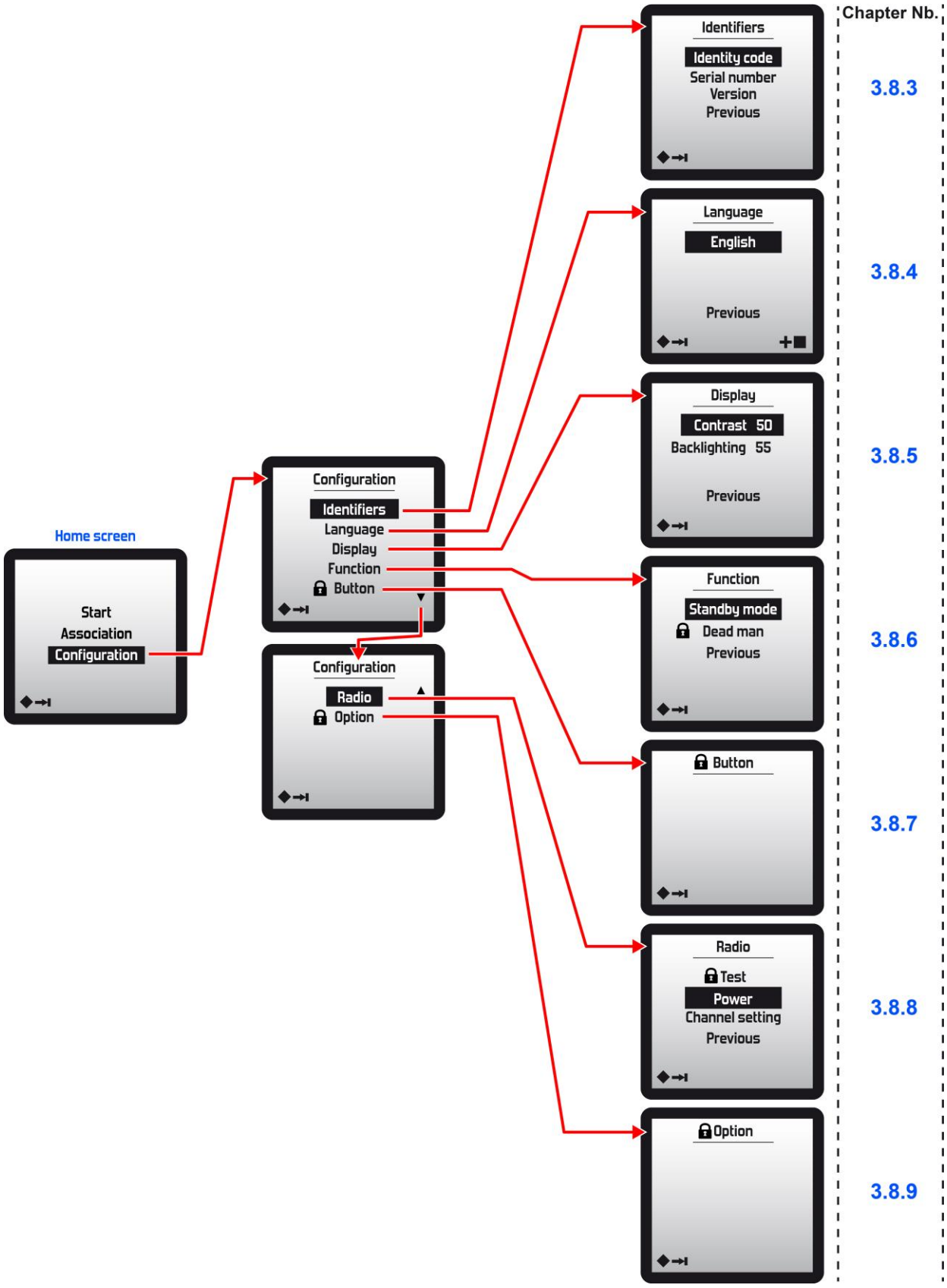
3.8.1 Accessing the configuration menu

The « **configuration** » menu is accessible on power up of the operator module :

1	**Switch on the operator module**	
2	**Press the black « Tab »pushbutton ◆→ and select the « Configuration » menu on the home screen.**	
3	**Press the green validate pushbutton ● to enter the configuration menu.**	
4	**The choice of parameters to be modified or reviewed is accessible by navigating using the black « Tab » navigation pushbutton ◆→ and the green validate pushbutton ●.**	

3.8.2 Configuration menu summary

The following menus are accessed from the « **configuration** » menu :



3.8.3 « Identifiers » menu

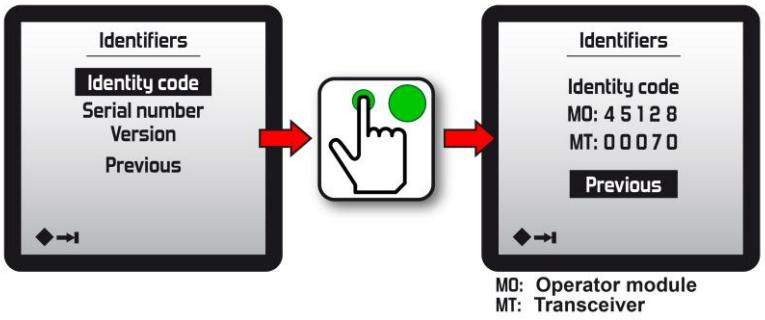
The « **Identifiers** » menu is used to display certain information of the radio control system such as:

- the **identity codes** of the radio control system,
- the **serial numbers** of Operator module and associated Transceiver,
- the **software version** of the Operator module,

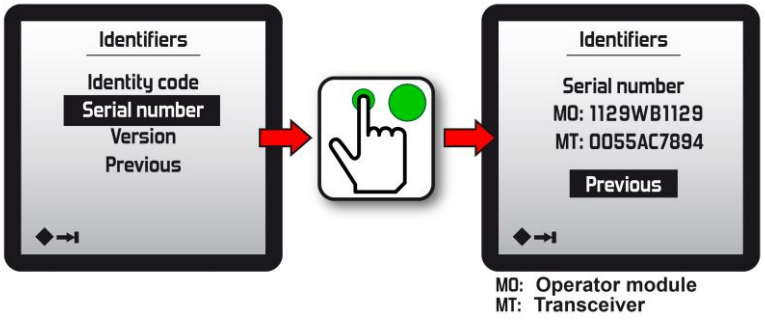
Note : These data can only be viewed (not modifiable).

3.8.3.1 Identity codes

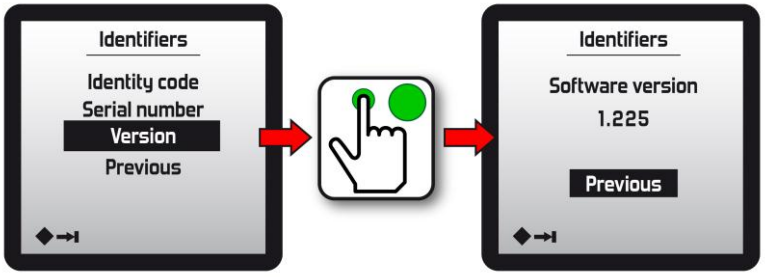
The identity codes of the radio control system are formed by 5 digits ; they are used to link an Operator module to a Transceiver.



3.8.3.2 Serial numbers



3.8.3.3 Software version of the Operator Module



3.8.4 « Language » menu

This menu is used to change the language used by the Operator module screen.

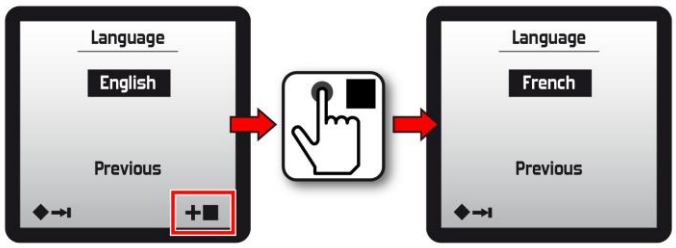
The following languages are available : **French**, **English**, **German**, **Spanish**, **Italian**, **Portuguese**, **Chinese** (non exhaustive list).

IMPORTANT : The **Transceiver** must be **switched on** in order to change the language.

1 **Switch on the Transceiver**

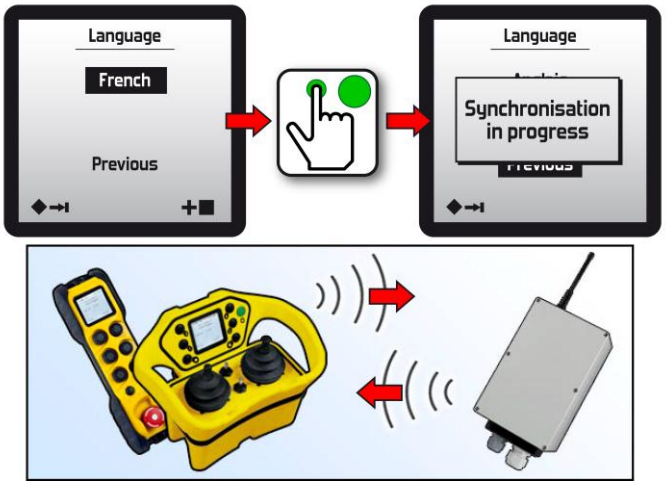
2 **Select the current menus language using the « Tab » navigation button ◆→I.**

Change the language selection using the black « Increment » pushbutton +■.



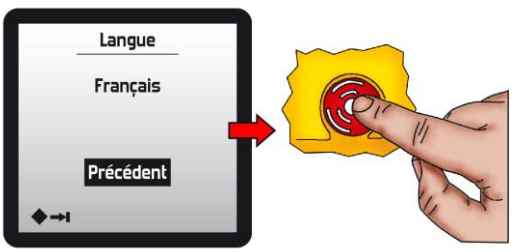
3 **Once you have chosen the new language, press the green validate pushbutton ●.**

The Operator module will transmit, by radio, the language configuration change to the Transceiver (Synchronisation in progress message)



4 **Once the data synchronisation is completed, press the emergency stop palmswitch.**

The next time you startup the operator module, the new language will be displayed on the screen.



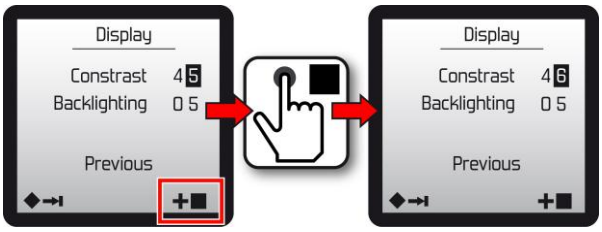
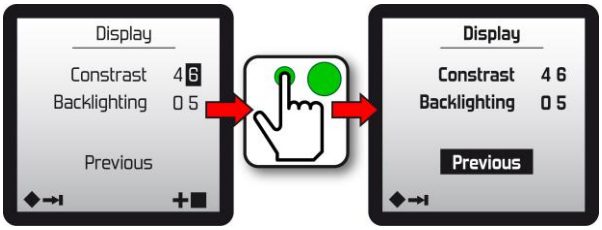
3.8.5 « Display » menu

The « **Display** » menu is used to set the screen parameters, such as :

- the **contrast**,
- the **backlighting**,

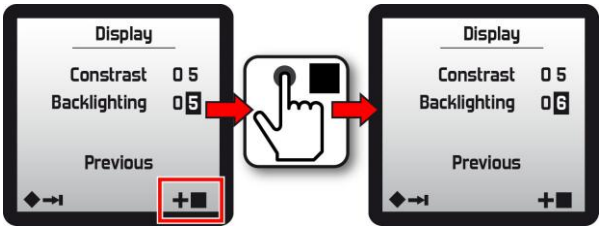
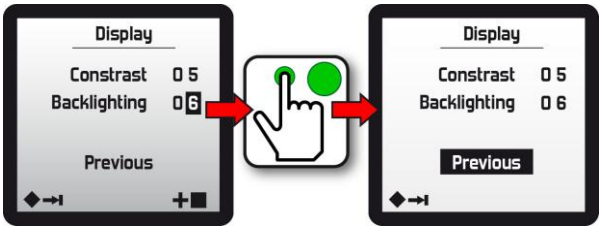
3.8.5.1 Contrast

Note : The screen contrast can be set between **40** and **99**.

1	**Select the contrast value using the « Tab » navigation button ◆⇥.** **Change the value using the black « Increment » pushbutton +■. Each time you press this button, the digit selected is incremented.**	
2	**Once you have selected the desired value, press the green validate pushbutton ●. The Operator module saves and applies the setting.**	

3.8.5.2 Backlighting

Note : The screen backlighting can be set between **00** (deactivated) and **99**.

1	**Select the backlighting value using the « Tab » navigation button ◆⇥.** **Change the value using the black « Increment » pushbutton +■. Each time you press this button, the digit selected is incremented.**	
2	**Once you have selected the desired value, press the green validate pushbutton ●. The Operator module saves and applies the setting.**	

3.8.6 « Function » menu

This menu is used to configure and activate certain Operator module functions.

The function activated by default is : « **Standby Mode** » (This function is described in the section « ***Automatic stop functions*** »).

IMPORTANT : The **Transceiver** must be **powered up** in order to modify the function settings.

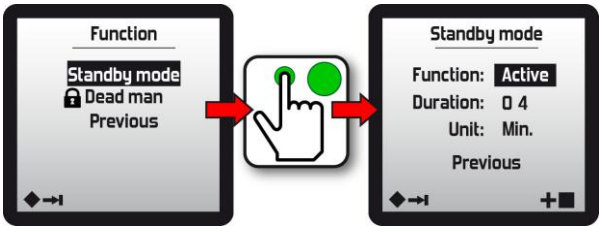
3.8.6.1 Standby

Note : The timeout prior to automatic stopping initiated by the **Standby Mode** function can be configured between **01** and **60**.minutes.
This function is activated by default.

1 **Switch on the Transceiver.**

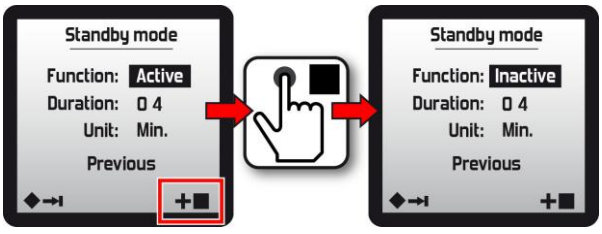
2 **In the "Function" menu, select the « Standby mode » function using the « Tab » navigation button .**

Validate your choice using the "Validate" button .



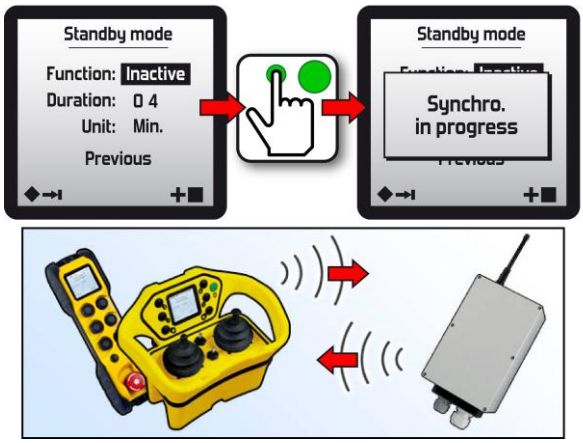
3 **Select the parameter to be changed using the « Tab » navigation button .**

Change the value using the black « Increment » pushbutton . Each time you press this button, the status of the selected field is modified or the selected digit is incremented.



4 **Once you have modified the parameters, press the green validate pushbutton .**

The Operator module will transmit, by radio, the configuration change to the Transceiver (Synchronisation in progress message).



3.8.7 « Button » menu

3.8.8 « Radio » menu

This menu is used to review and configure the radio characteristics of the radio control system.

IMPORTANT : The **Transceiver** must be **powered up** in order to modify the radio transmission settings.

3.8.8.1 Power

This menu is used to modify :

- the **radio transmit power level** of the **Operator module**,
- the **radio transmit power level** of the **Transceiver**

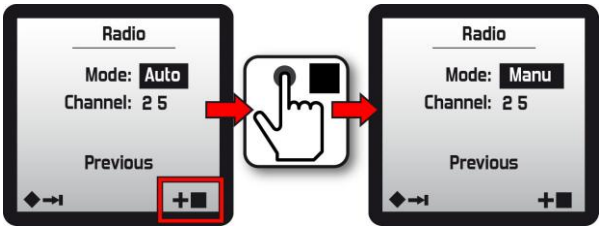
The radio transmit power level can be adjusted to limit the radio control zone as may be required in certain cases.
The radio transmit power can be adjusted between **01** and **10**.

Warning ! : Too low a value will significantly impact the transmit range ; you must keep in mind the working distance between the Operator module and the Transceiver with respect to your needs.

1 **Switch on the Transceiver.**

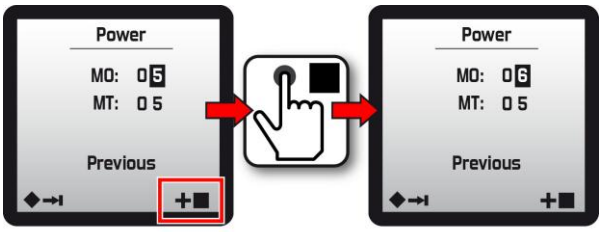
2 **In the "Radio" menu, select the "Power" sub-menu using the « Tab » navigation button ◆⇥.**

Validate your choice using the "Validate" button ●.



3 **Select the parameter to be modified using the « Tab » navigation button ◆⇥.**

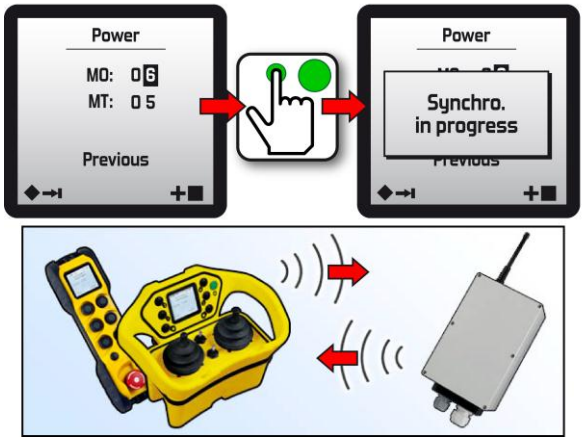
Modify the value using the black « Increment » pushbutton +■. Each time you press this button, the selected digit is incremented.



MO: Operator module
MT: Transceiver

4 **Once the parameters have been modified, press the green validate pushbutton ●.**

The Operator module will transmit, by radio, the change of radio power to the Transceiver (Synchronisation in progress message).



3.8.8.2 Setting the radio channel

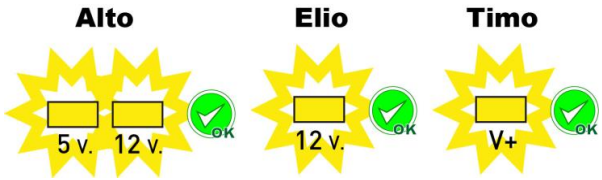
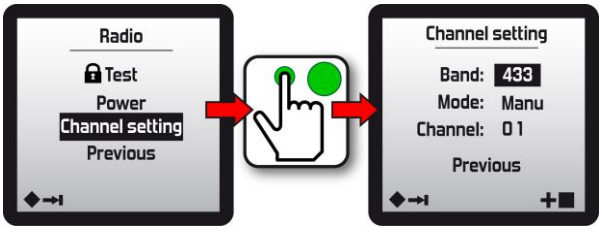
This menu is used to configure :

- the **radio transmit mode** of the radio control system,
- the **number of the radio channel** used in the frequency band,

IMPORTANT : The **Transceiver** must be **powered up** and available to perform the following settings.

Radio transmit mode	**Auto :** *Automatic mode* At startup, the operator module searches for the Transceiver if it is not present on the current channel.
	Manu : *Manual Mode* The radio channel can be manually defined for the radio control system.
Frequency band	**433 :** *433-434MHz* (64 radio channels available)
	869 : *869MHz* (12 radio channels available)
Radio channel	**01** to **64** in 433-434MHz frequency bands.
	01 to **12** in 869MHz frequency band.

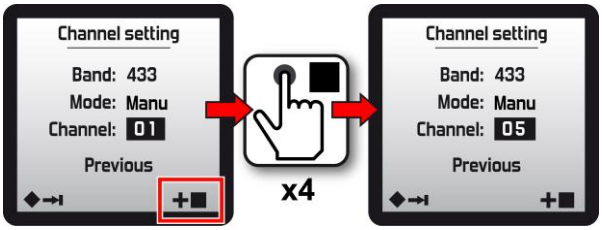
Procedure:

1	**Switch on the Transceiver.**	
2	**In the "Radio" menu, select the "Set channel" sub-menu using the « Tab » navigation button .** **Validate your choice using the "Validate" button .**	

3

Select the parameter to be modified using the « Tab » navigation button ◆⇥.

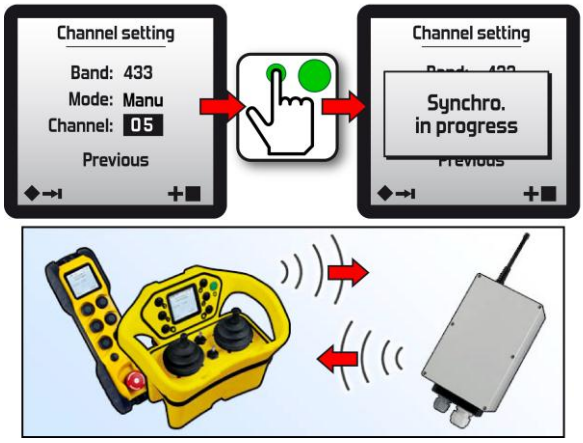
Modify the value using the black « Increment » pushbutton +■. Each time you press the button, the status of the selected field is changed or the selected digit is incremented.



4

Once you have modified the parameters, press the green validate pushbutton ●.

The Operator module will transmit, by radio, the changes to the Transceiver (Synchronisation in progress message).



3.8.8.3 List of available radio frequencies

433-434 MHz Bands

Channel Nb.	Frequency MHz		Channel Nb.	Frequency MHz	
01	433,1025		33	433,9025	(2)
02	433,1275		34	433,9275	(1) (2)
03	433,1525		35	433,9525	(2)
04	433,1775		36	433,9775	(1) (2)
05	433,2025		37	434,0025	(2)
06	433,2275		38	434,0275	(1) (2)
07	433,2525		39	434,0525	(2)
08	433,2775		40	434,0775	(2)
09	433,3025		41	434,1025	(2)
10	433,3275		42	434,1275	(2)
11	433,3525		43	434,1525	(2)
12	433,3775		44	434,1775	(2)
13	433,4025		45	434,2025	(2)
14	433,4275		46	434,2275	(2)
15	433,4525		47	434,2525	(2)
16	433,4775		48	434,2775	(2)
17	433,5025		49	434,3025	(2)
18	433,5275		50	434,3275	(2)
19	433,5525		51	434,3525	(2)
20	433,5775	(1)	52	434,3775	(2)
21	433,6025		53	434,4025	(2)
22	433,6275	(1)	54	434,4275	(2)
23	433,6525		55	434,4525	(2)
24	433,6775	(1)	56	434,4775	(2)
25	433,7025		57	434,5025	(2)
26	433,7275	(1)	58	434,5275	(2)
27	433,7525		59	434,5525	(2)
28	433,7775	(1)	60	434,5775	(2)
29	433,8025	(2)	61	434,6025	(2)
30	433,8275	(1) (2)	62	434,6275	(2)
31	433,8525	(2)	63	434,6525	(2)
32	433,8775	(1) (2)	64	434,6775	(2)

869 MHz Band

Channel Nb.	Frequency MHz
01	869,9875
02	869,9625
03	869,9375
04	869,9125
05	869,8875
06	869,8625
07	869,8375
08	869,8125
09	869,7875
10	869,7625
11	869,7375
12	869,7125

1 = list of available frequencies for Denmark

2 = list of available frequencies for Singapore

3.8.9 « Option » menu

3.9 Operator module automatic stop functions

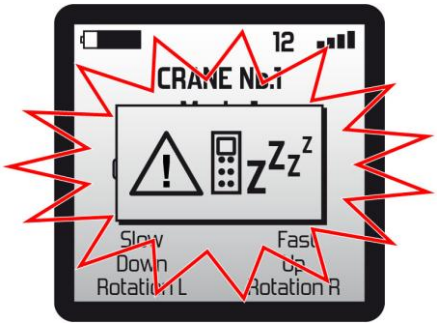
3.9.1 Standby mode

The operator module is equipped, as a standard function, with the « **Standby mode** » automatic stop function ; this function is linked to the control components.

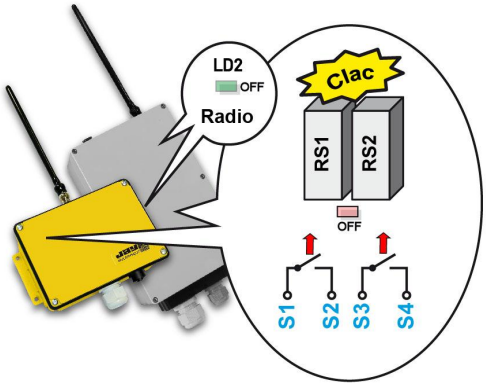
Operating principle :

The « **Standby mode** » function is activated when the control components of the operator module have not been used over a (programmable) period of time.

10 seconds before activation of the « **Standby mode** » function, the operator module displays the following screen:



If no action is performed on the control components (pushbuttons) within the 30 seconds, the operator module stops and deactivates the safety relays RS1 and RS2 of the Transceiver.



To restart the system, press the "On" button on the operator module.

Configuration:

The standby mode function time delay can be configured between 01 and 60 minutes.
This function can be activated or deactivated ; see section ***Configuration menu / Function menu.***

3.9.2 "Deadman"

This function is actuated when the control components have not changed position over a (programmable) period of time

This function can also be associated to a movement sensor, with each detection resetting the programmed duration to zero.

3.10 Default configuration of operator module

Language of screen menus	Language specified on configuration sheet supplied with radio control system
Screen display	• **Contrast :** 50 • **Backlighting :** 50
"Standby mode" function	• Function activated • Time delay before automatic stopping of operator module : 4 minutes
Radio transmit power	• **Operator module :** 08 • **Transceiver :** 08
Radio transmit mode	Manual
Frequency band	869 MHz or 433-434MHz (depends on equipment)
Number of radio channel used	Frequency with automatic assignment according to chart
Assignment of control components / transceiver outputs	Per application configuration (see configuration sheet supplied with radio control system)
Command interlocking	Per application configuration (see configuration sheet supplied with radio control system)

4 Charger and Support chargers

WARNING

THERE IS A RISK OF EXPLOSION IF BATTERY IS REPLACED BY A BATTERY OF AN INCORRECT TYPE. ONLY BATTERY PWB SUPPLIED BY JAY ELECTRONIQUE IS SUITABLE. ONLY THE JAY ELECTRONIQUE CHARGERS ARE SUITABLE FOR RECHARGING THE BATTERIES.
DO NOT EXPOSE THE BATTERY TO TEMPERATURE ABOVE 50°C(122°F). DO NOT OPEN OR ATTEMPT TO MODIFY THE BATTERY. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE FIRE OR EXPLOSION. PLEASE RESPECT THE DISPOSE OF USED BATTERIES AS DIRECTED.

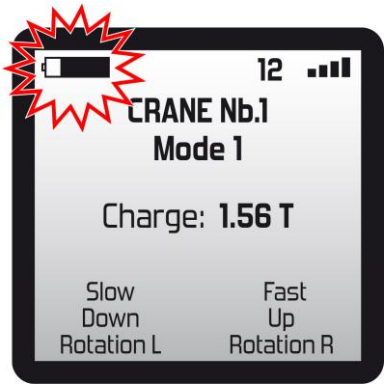
4.1 Information on battery storage

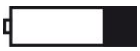
The operator module battery must be stored charged with a minimum of charge capacity of 40%. The storage must be in a clean and dry place at room temperature, and in all cases, in accordance with the temperatures specified in chapter ***Technical charactéristics / Operator modules***.

Self-discharge is estimated at 10% the first month and then lower (it is mandatory to recharge the battery every 9 months min.).

4.2 Operator module battery : charge level

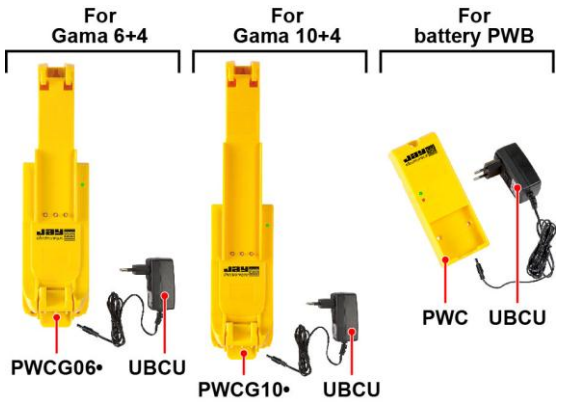
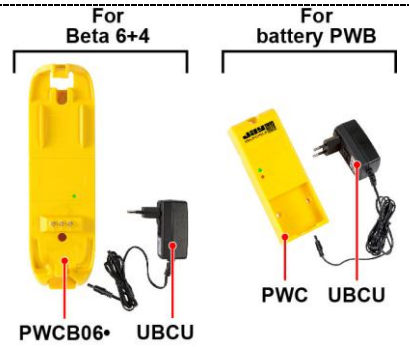
The charge level of the battery in the operator module is displayed on the screen during use:



Symbol	Corresponding level
	Remaining charge > 80%
	Remaining charge between 80% and 50%
	Remaining charge between 50% and 25%
	Remaining charge < 25%
	Battery must be recharged (charge < 10%)

4.3 General view of charger and support chargers

Given below are the charger and support chargers to be used in accordance with your operator module model :

Type of operator module	Type of battery	Charger and support chargers
Gama 10+4 Gama 6+4	Plug-in type PWB	
Beta 6+4	Plug-in type PWB	
Beta 2+4	Internal battery	
Pika Moka	Plug-in type PWB	

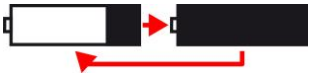
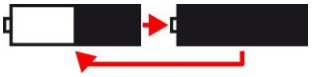
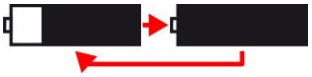
4.4 Information on battery charge

The charging time for an 80% battery charge is 3 h ; beyond this time, the charger or support charger delivers a trickle charge.

A 20 min. charge represents around 1h of endurance.

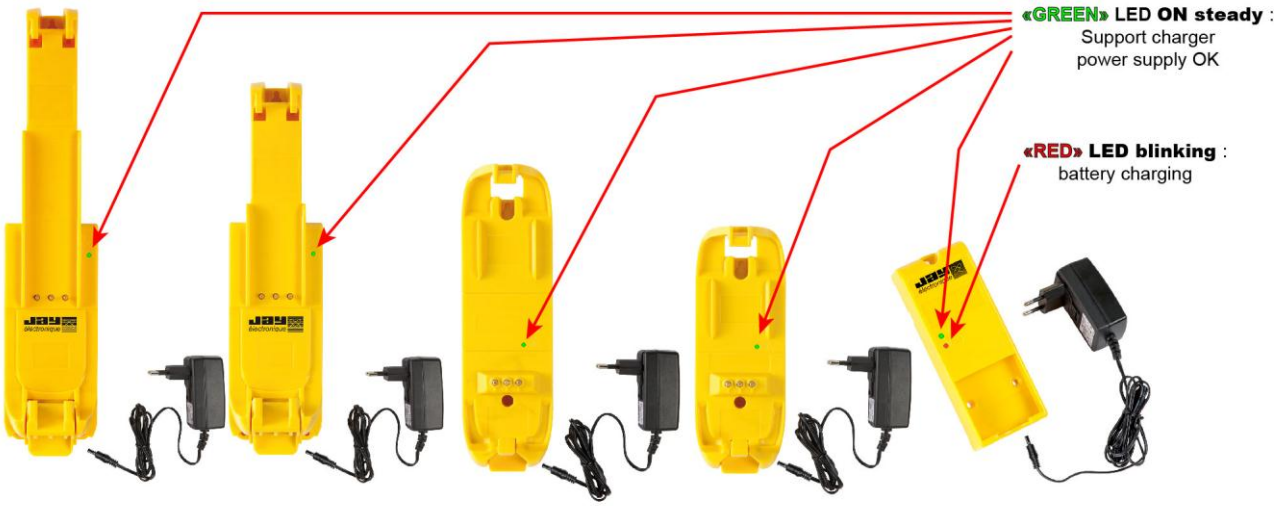
The number of full charge cycles is estimated at 500 cycles min. (with no degradation of the battery).

When the operator module is placed on a support charger (Gama or Beta), the charge level of the battery is indicated on the operator module screen:

Symbol (flashing)	Corresponding level
	Start of battery charging Battery charged between 0% and 25%
	Battery charged between 25% and 50%
	Battery charged between 50% and 75%
	Charging complete

Remarque : Under low (negative) temperature operating conditions, you may observe an endurance loss of 20%. The operator module is however equipped with an internal sensor which accurately indicates the remaining battery endurance regardless of the operating conditions.

4.5 Indicator light on charger and support chargers



The red indicator light on the **PWC** charger gives information on the charge or a message in the event of a malfunction :

RED indicator light	GREEN indicator light	Indication
OFF	ON	Battery charge complete
OFF	OFF	Temperature fault or no power supply
ON	OFF	Charging fault (electronic malfunction)

4.6 Supply of chargers and support chargers

The chargers can be supplied in different ways as described below.

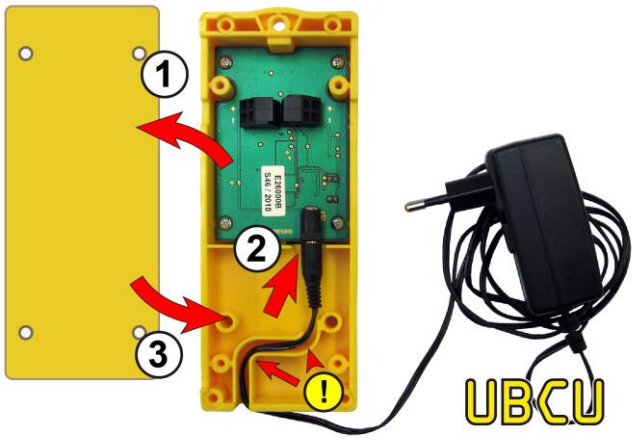
Note : The chargers must be opened to connect the power supply ; a cover plate is provided for this purpose. Use a Pozidriv **PZ2**. screwdriver.

4.6.1 Power supply by voltage adapter

Adapter ref. :
UBCU 115-230VAC/12VDC.

The adapter is connected on a supply plug inside the charger.

1- Remove the housing cover.
2- Connect the **UBCU** supply plug to the internal connector of the charger.
3- Close the housing, taking care not to pinch the cord.

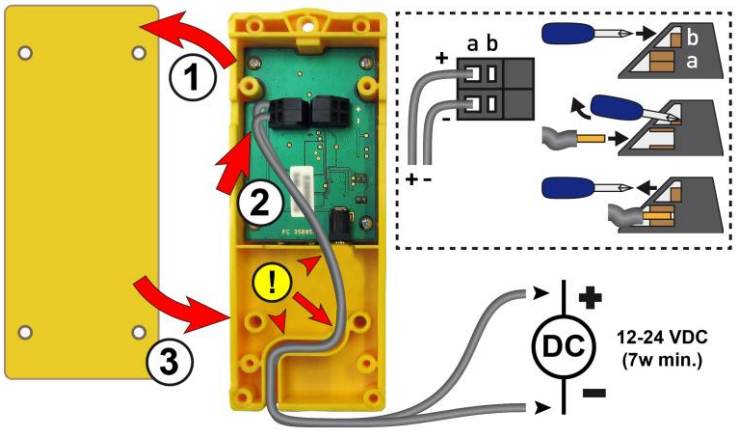


4.6.2 Power supply by external source

The power supply must provide a regulated, stabilised voltage of **12-24VDC 7w min**.

The power supply is connected on a terminal strip with 2 spring-type terminals inside the charger (wire section 0.08mm² to 2.5mm² max.)

1- Remove the housing cover.
2- Connect the wires of the external power supply to the internal terminal block.
3- Close the housing, taking care not to pinch the wires.



4.6.3 Supply of chargers in parallel

Several chargers/support chargers can be connected together with the same power source.

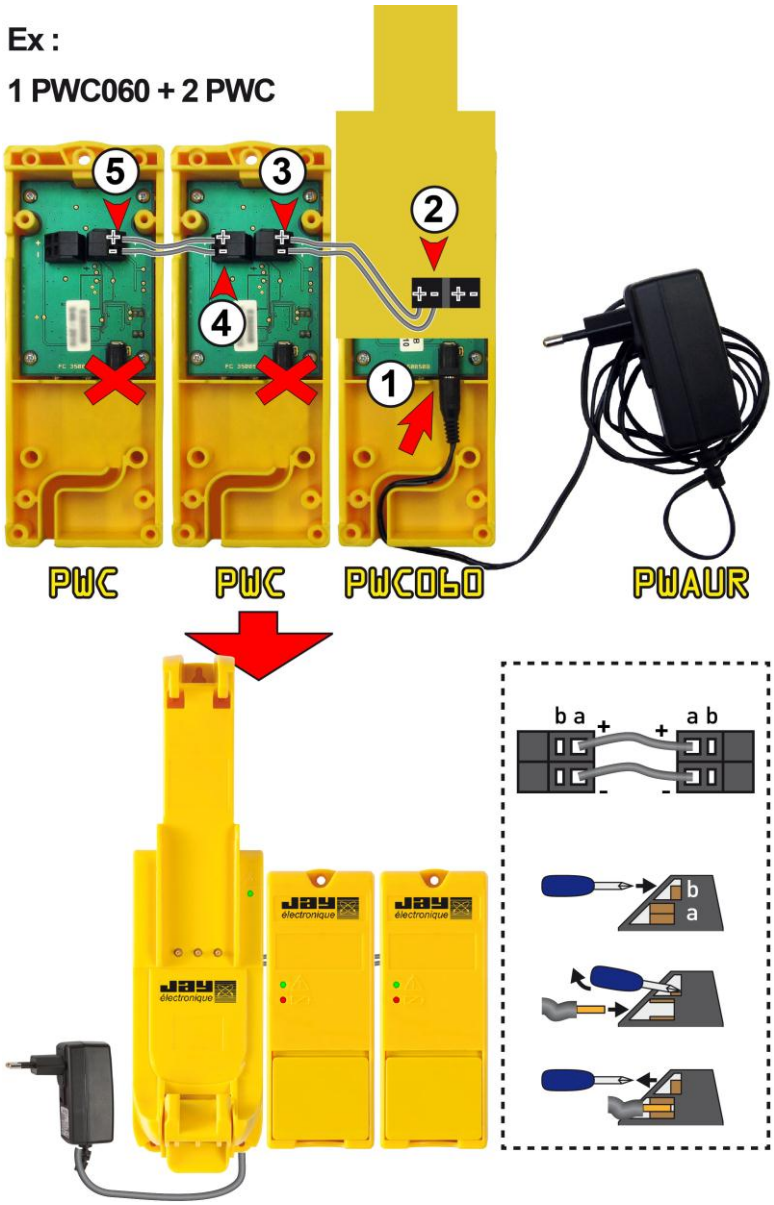
The voltage adapter ref. :**PWAUR** is **mandatory** and allows connecting up to **6 chargers** together.

An external power supply can be used ; it should deliver a regulated, stabilised voltage of 12-24VDC 36W min.

The power supply is connected to the first charger, then by wire connection by bridging from charger to charger (wire section 0.08mm² to 2.5mm² max)

Important :

« **+** » terminal connected to « **+** » terminal and « **-** » terminal connected to « **-** » terminal.



4.6.4 Charging rack PWR (for PWC battery chargers only)

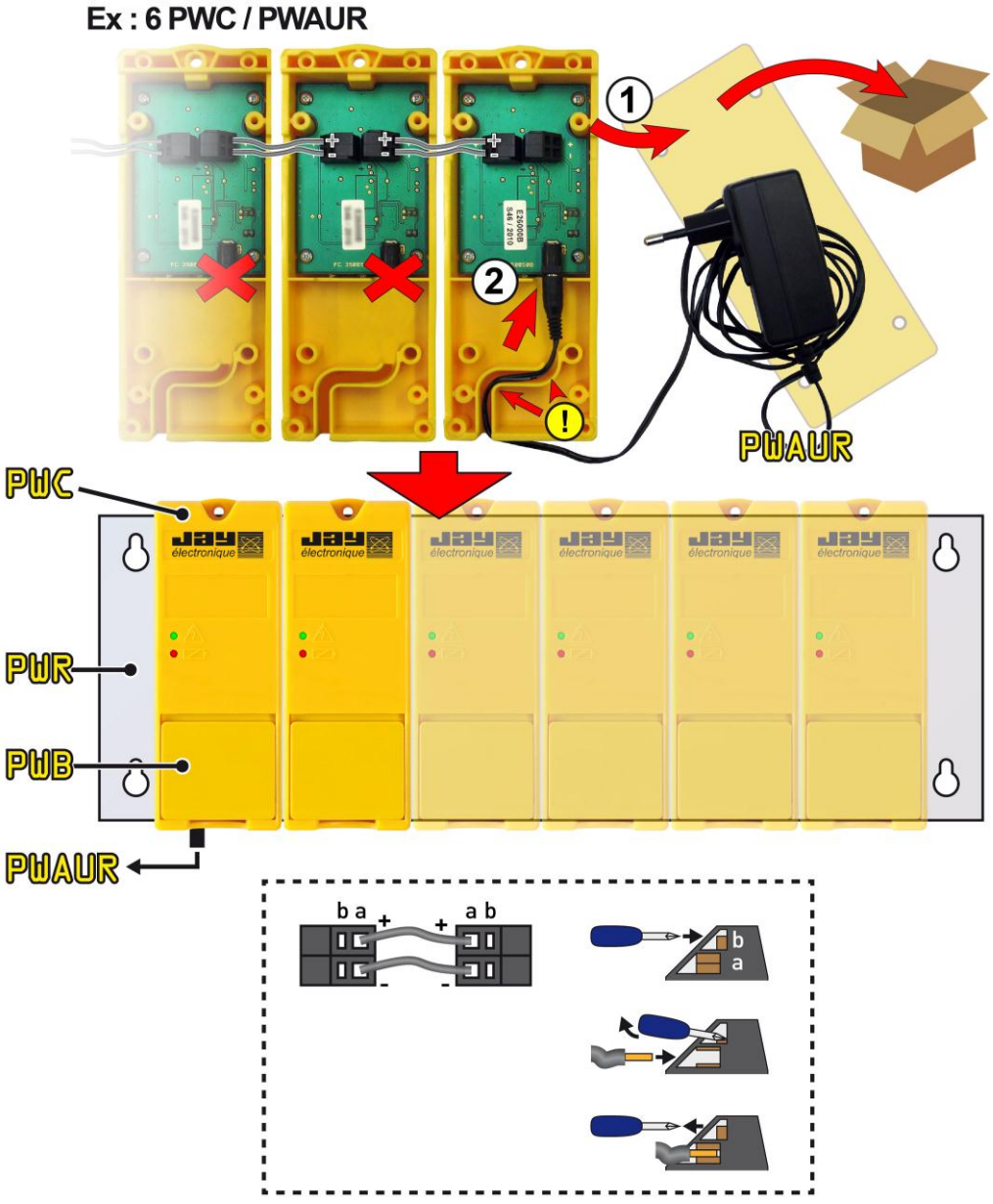
Using a charging rack ref. : **PWR** which can receive up to 6 **PWC** chargers.

The voltage adapter ref. :**PWAUR** is **mandatory** and allows connecting up to **6 chargers** together.

An external power supply can be used ; it should deliver a regulated, stabilised voltage of 12-24VDC 36W min.

The power supply is connected to the first charger, then by wire connection by bridging from charger to charger (wire section 0.08mm² to 2.5mm² max).

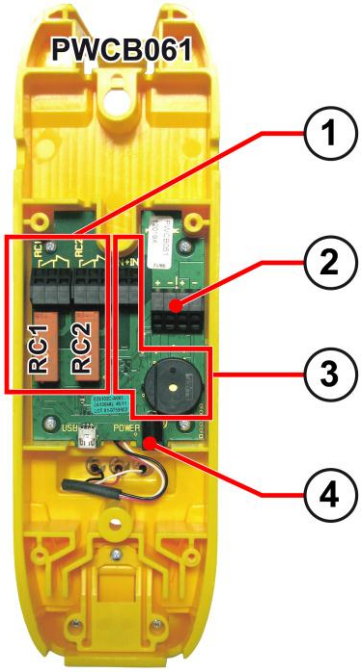
Important :
« **+** » terminal connected to « **+** » terminal and « **-** » terminal connected to « **-** » terminal.



4.7 Options on chargers

Concerned models : PWCB021 and PWCB061

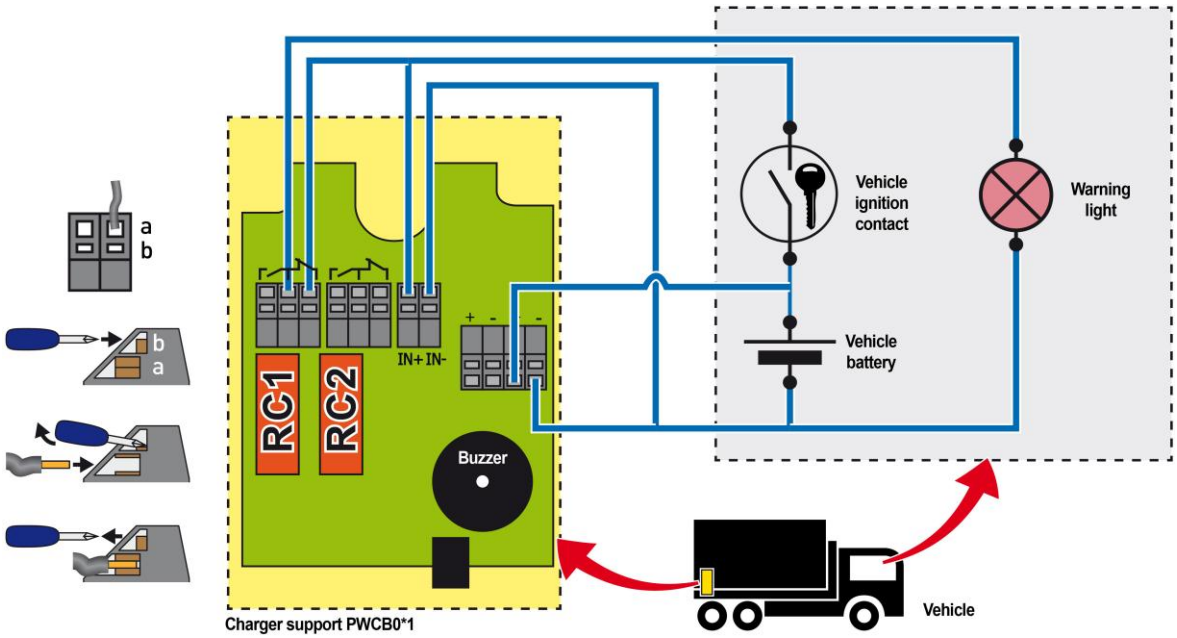
Chargers equipped with "all options" allow to detect and alert the user about the presence or absence of Operator module on the support.



1	**Relays RC1 and RC2 :** When the Operator module is charging on the support charger, the relays **RC1** and **RC2** are activated (change-over contacts).
2	Connector for external power supply (regulated, stabilised voltage of 12-24VDC)
3	**Internal Buzzer :** When a voltage is applied into the digital input (terminals IN + and IN-) and the Operator module is absent from the support charger, the internal buzzer is activated for 1 minute.
4	Supply plug for voltage adapters **UBCU** or **PWAUR**

Wiring diagram example with the use of support charger « all options » on a vehicle

If the Operator module is not present on the support charger when starting the vehicle, the internal buzzer is activated for 1 minute and a warning light comes on (ideally located in the cockpit of the vehicle).



Relays RC1 and RC2 characteristics :

Contacts	AgNi 0,15
Maximum power at cosphi=1	2000 VA
Max. current / voltage switching	8 A / 400 VAC
Min. current / voltage advised switching	50 mA / 12 VDC
Switching cycles at 250 VAC, 8 A, cosphi=1	100 000
Switching cycles at 24 VDC, 8 A	50 000
Tests per EN 60947-5-1	DC13 at 0,5 A / 24 VDC AC15 at 3 A / 250VAC

(IN+, IN-) Digital input characteristics :

Low level on opto-coupler input	DC Voltage < 2 V
High level on opto-coupler input	DC Voltage > 3 V
Maximum voltage level on an input with no damage	30VDC

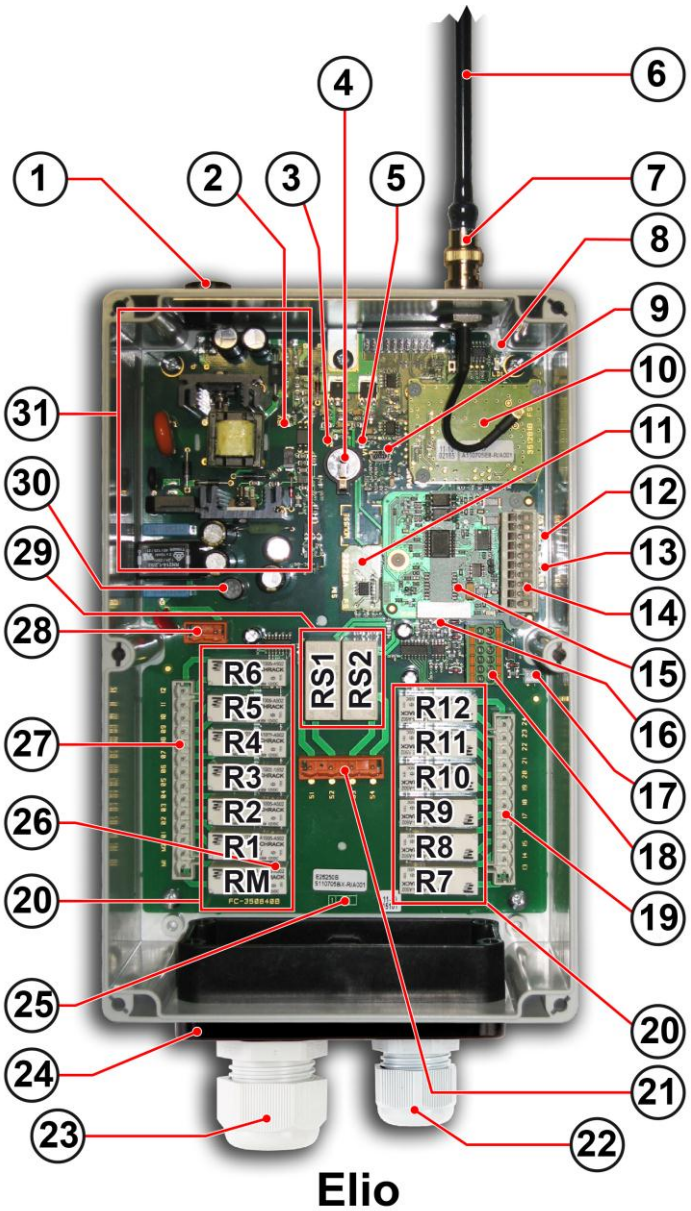
5 Transceiver

5.1 General view of Transceivers

5.1.1 Elio Transceiver

TO AVOID ANY RISK OF ELECTROCUTION, NEVER OPEN THE TRANSCEIVER HOUSING WHICH IS POWERED UP.

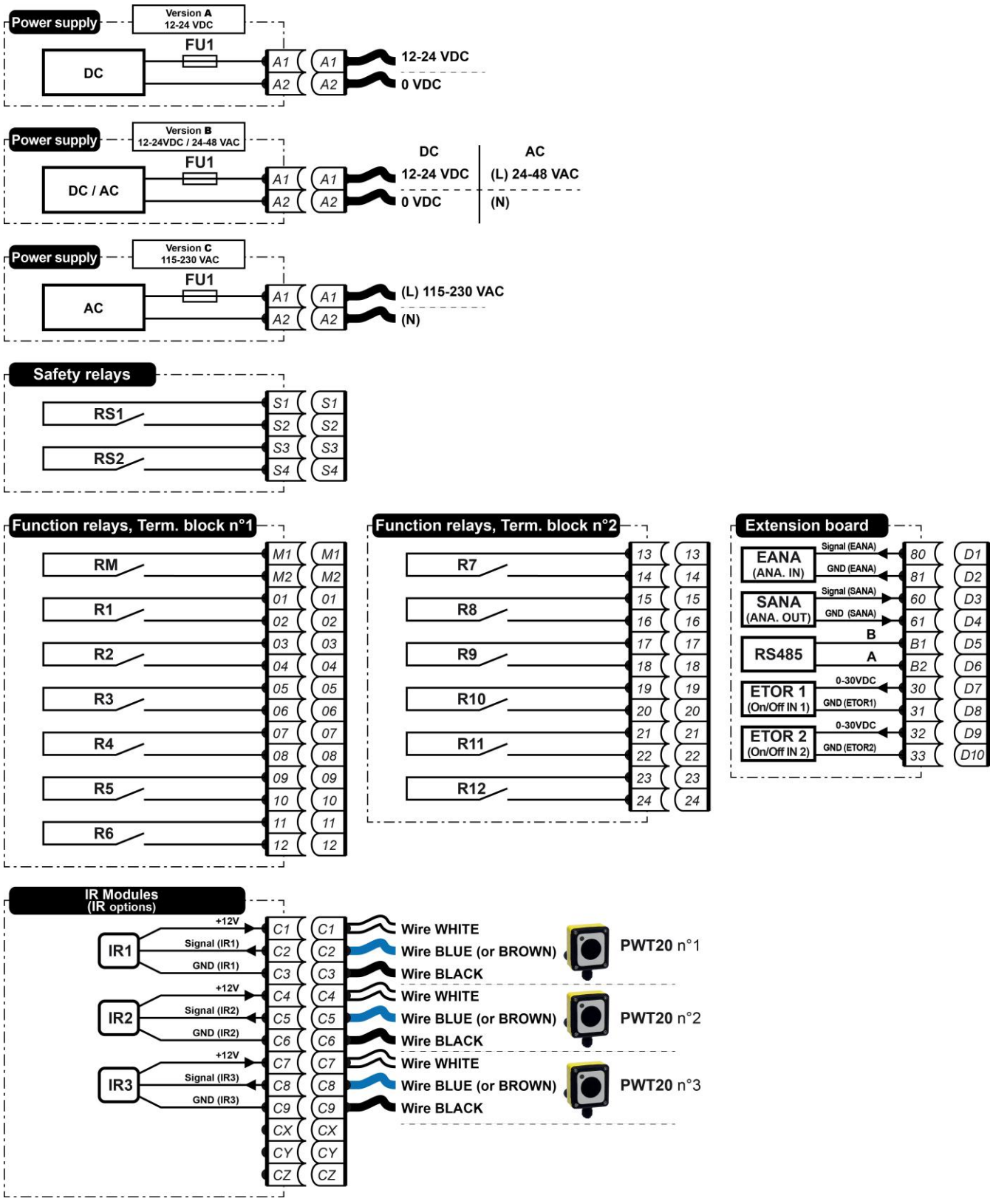
The opening of the housing must be done by ensuring that the power supply cables and control cables are out of voltage



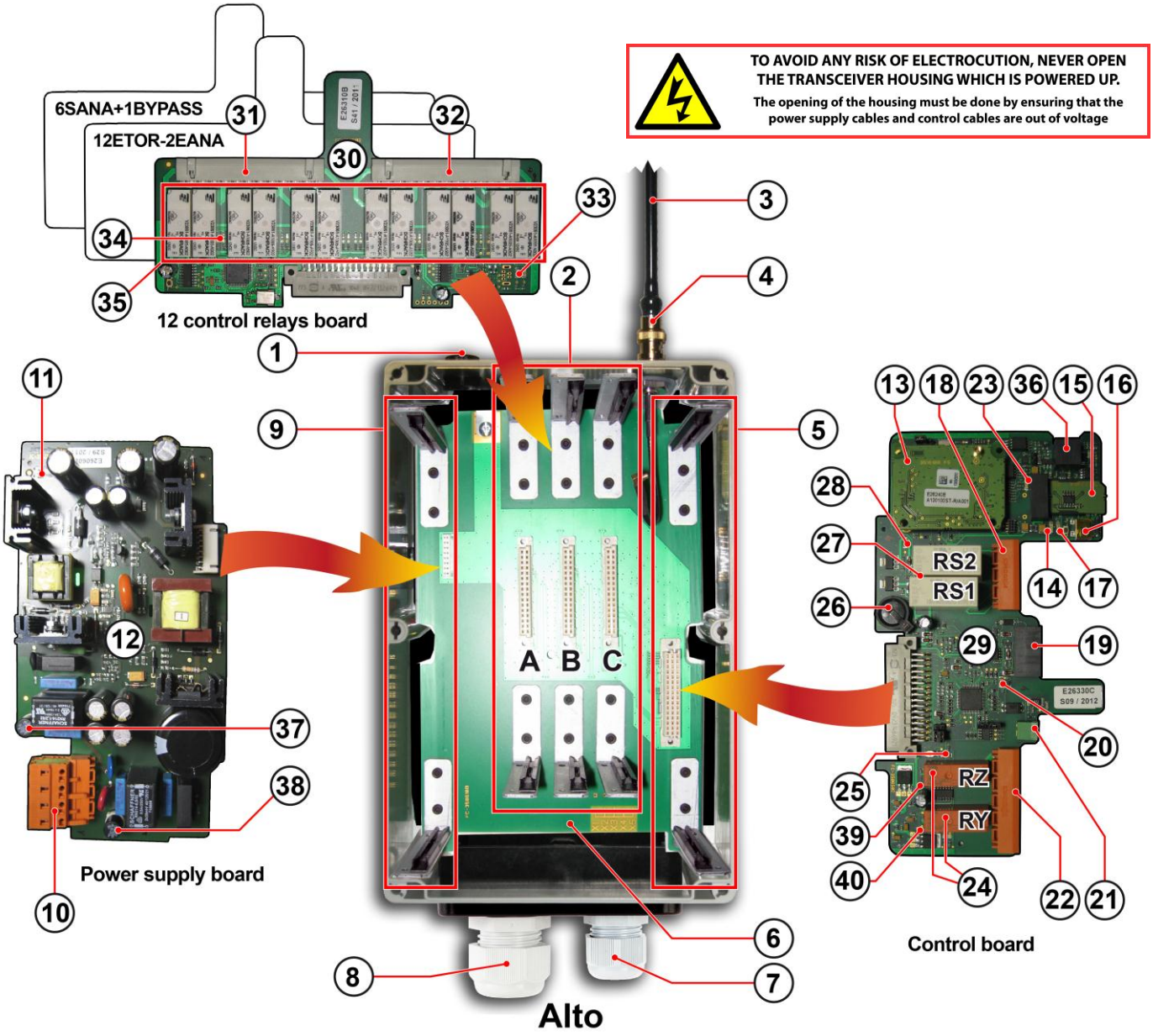
1	Breathable membrane (internal anti-condensation)
2	Yellow indicator light **12V** : motherboard power supply OK
3	Yellow indicator light **V2** : processor power supply No. 2 OK
4	Backup battery (daily time stamping of events)
5	Yellow indicator light **V1** : processor power supply No. 1 OK
6	Antenna (BNC connection)
7	Antenna BNC / antenna extension connector
8	Red indicator light **LD1** : Diagnostics
9	USB connector (configuration and diagnostics)
10	Bidirectional radio module
11	SIM card (system configuration backup)
12	Green indicator light **LD2** : Radio reception + Diagnostics
13	Red indicator light **LD3** : Diagnostics
14	Input/output connector of extension board (option)
15	Extension board (analogue outputs, On/Off, RS485 etc.) (option)
16	Red indicator light: status of safety relays **RS1** and **RS2**
17	Connector for internal horn (option)
18	Connector for IR cells (option, IR validation startup / Operator presence detection)
19	Connector for relay outputs **R7** to **R12**
20	Function relay
21	Connector for safety relay outputs
22	Cable gland M25 (signal input/output)
23	Cable gland M32 for passage of « control » and power supply cables
24	Removable base
25	Main board
26	Red indicator light : status of function relays
27	Connector for relay outputs **RM**, **R1** to **R6**
28	Power supply connector for Elio Transceiver
29	Safety relays **RS1** and **RS2**
30	Fuse **FU1**
31	Transceiver power supply circuit

5.1.1.1 Wire terminal strips for Elio Transceiver

Note : The match-up between the Operator module control component commands and the Transceiver relays is given on the configuration sheet supplied with the radio control system.



5.1.2 Alto Transceiver

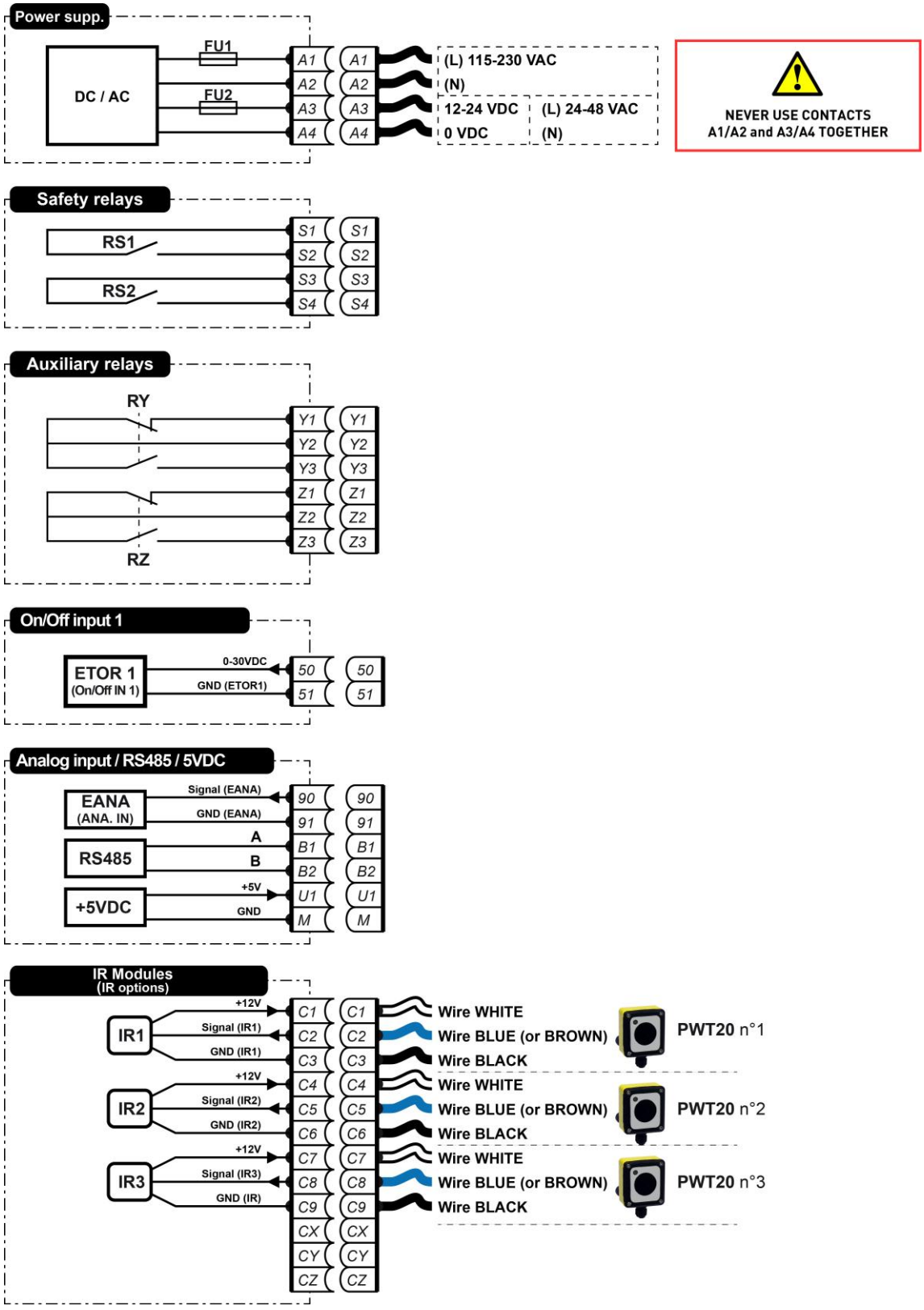

TO AVOID ANY RISK OF ELECTROCUTION, NEVER OPEN THE TRANSCEIVER HOUSING WHICH IS POWERED UP.
The opening of the housing must be done by ensuring that the power supply cables and control cables are out of voltage
6SANA+1BYPASS
12ETOR-2EANA
12 control relays board
Power supply board
Control board
A B C
RS2
RS1
RZ
RY
Alto

1	Breathable membrane (internal anti-condensation)
2	Positions for Input/Output board (Slot A, B, C)
3	Antenna (BNC connection)
4	Antenna BNC / antenna extension connector
5	Position for management board
6	Motherboard
7	Cable gland M25 (signal input/output)
8	Cable gland M32 for passage of « control » and power supply cables
9	Position for power supply board
10	Power supply connector for Alto Transceiver
11	Yellow indicator lights **12V** and **5V**: board power supply OK
12	Power supply board
13	Bidirectional radio module
14	Green indicator light **LD2** : Radio reception + Diagnostics
15	SIM card (system configuration backup)
16	USB connector (configuration and diagnostics)
17	Red indicator light **LD3** : Diagnostics
18	Connector for safety relay outputs
19	Connector for IR cells (option : IR validation startup / Operator presence detection)
20	Red indicator light for active On/Off input

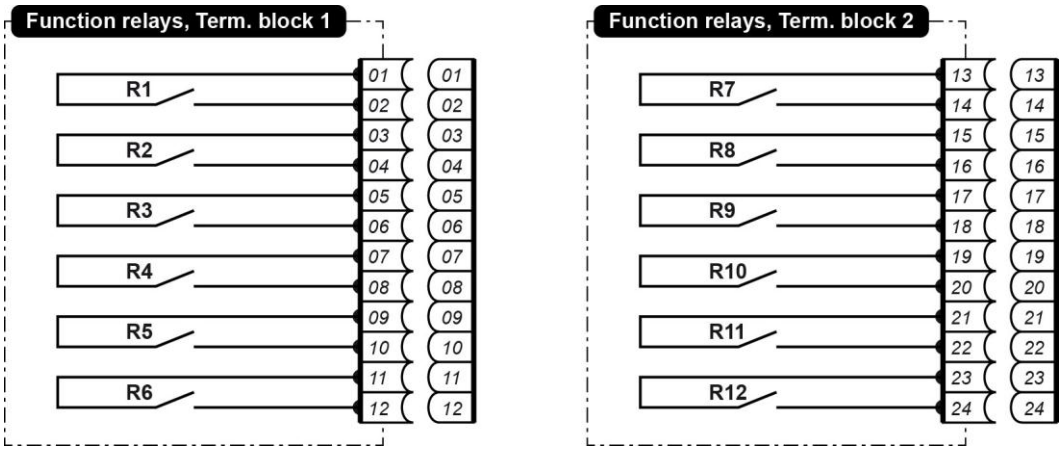
21	Terminal strip for relays ETOR
22	Terminal strip for relays **RY** and **RZ**
23	Yellow indicator light : Control board power supply OK
24	Relays **RY** and **RZ**
25	Red indicator light **LD1** : Diagnostics
26	Backup battery (daily time stamping of events)
27	Safety relays **RS1** and **RS2**
28	Red indicator light : status of safety relays **RS1** and **RS2**
29	Management board
30	Additional board, « 12 control relays »
31	Connector for relay outputs **R1** to **R6**
32	Connector for relay outputs **R7** to **R12**
33	Red and green indicator lights: Relay board status (red=fault)
34	Red indicator light : status of function relays
35	Function relays
36	Terminal strip (Analogue input 1, RS485, +5VDC output, etc.)
37	Fuse **FU1**
38	Fuse **FU2**
39	Red indicator light : status of **RZ** relay
40	Red indicator light : status of **RY** relay

5.1.2.1 Wiring terminal strips of Alto Transceiver

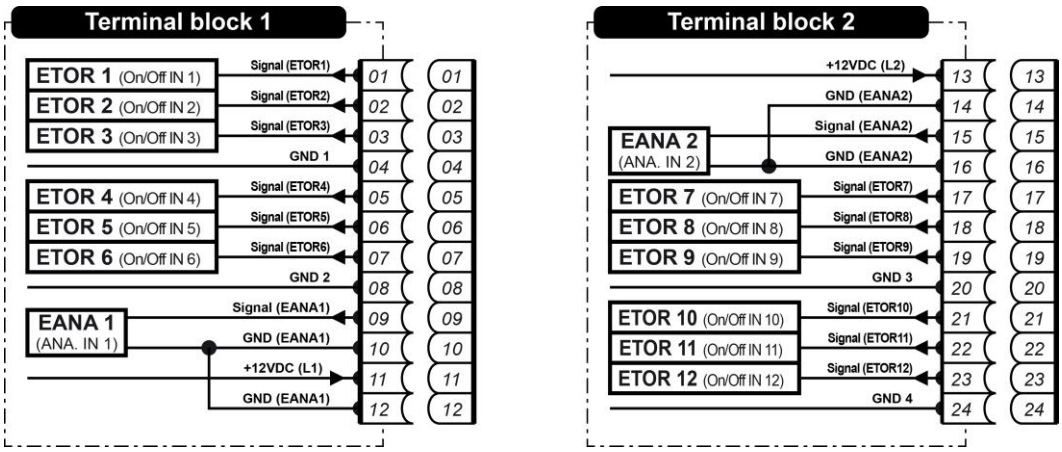
Note : The match-up between the Operator module control component commands and the Transceiver relays is given on the configuration sheet supplied with the radio control system.



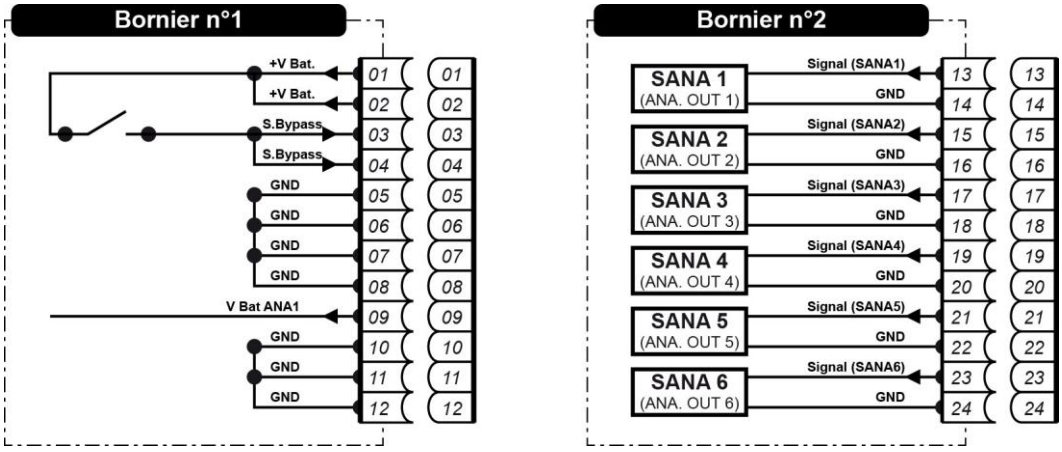
5.1.2.2 Board with 12 control relay outputs



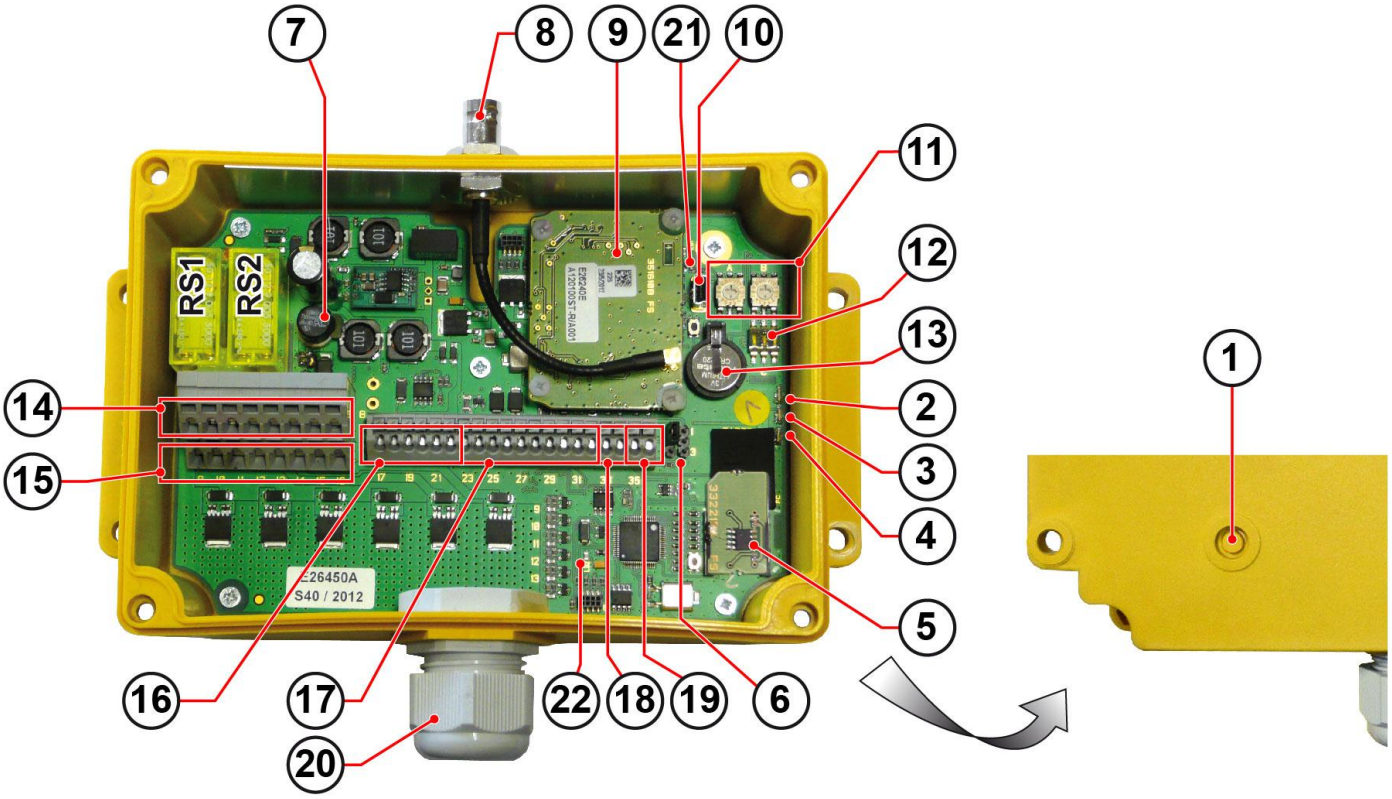
5.1.2.3 Board with 12 On/Off inputs + 2 analogue inputs



5.1.2.4 Board with 6 analogue outputs + 1 BYPASS output



5.1.3 Timo Transceiver

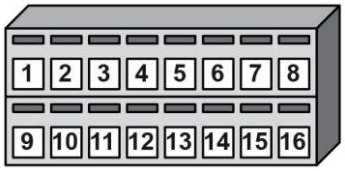


Timo

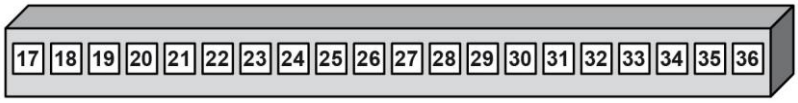
1	Breathable membrane (internal anti-condensation)
2	Yellow indicator light : Transceiver power supply OK
3	Red indicator light : status of safety relays **RS1** and **RS2**
4	Green indicator light **LD2** : Radio reception + Diagnostics
5	SIM card (system configuration backup)
6	End line configuration jumpers for RS485 and CAN links
7	Fuse **FU1**
8	BNC connector for antenna or extension (Transceiver with external antenna version)
9	Bidirectional radio module
10	USB connector (configuration and diagnostics)
11	Rotary DIP switches for bus CANopen configuration : addressing
12	DIP switch bus CANopen configuration : data rate
13	Backup battery (daily time stamping of events)
14	Terminal block : constacts of safety relays **RS1** and **RS2** and Transceiver Power supply
15	Terminal block : On/Off or PWM outputs
16	Terminal block : Infrared cells for IR options
17	Terminal block : ANA outputs and On/Off inputs
18	Terminal block : CAN link
19	Terminal block : RS485 link
20	M25 cable gland(according to Timo Transceiver version, other connectors as : M12, C16 or industrial can ba instead of or in addition of the cable gland)
21	Red indicator light **LD1** : Diagnostics
22	Red indicator light **LD3** : Diagnostics

5.1.3.1 Wiring terminal blocks of Timo Transceiver

Note : The match-up between the Operator module control component commands and the Transceiver inputs/outputs is given on the configuration sheet supplied with the radio control system.

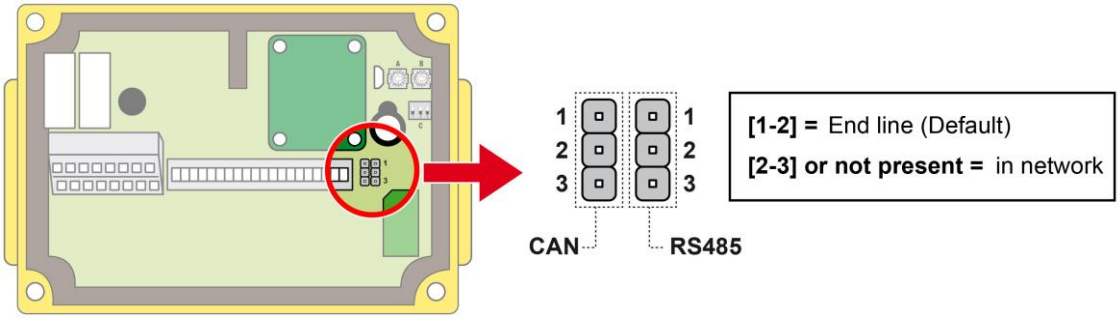


1	RS1 Safety relay contact
2	
3	RS2 Safety relay contact
4	
5	GND
6	GND (for bridging)
7	V+ Transceiver Timo power supply
8	V+ Transceiver Timo power supply (for bridging)
9	On/Off or PWM output nb.1
10	On/Off or PWM output nb.2
11	On/Off or PWM output nb.3
12	On/Off or PWM output nb.4
13	On/Off or PWM output nb.5
14	On/Off or PWM output nb.6
15	V+ On/Off or PWM outputs
16	V+ Transceiver Timo power supply (for bridging)



17	IR Module nb.1 : GND (black wire)
18	IR Module nb.1 : Signal (blue or brown wire)
19	IR Module nb.1 : +12V (white wire)
20	IR Module nb.2 : GND (black wire)
21	IR Module nb.2 : Signal (blue or brown wire)
22	IR Module nb.2 : +12V (white wire)
23	Analog input
24	GND
25	Analog output nb.1
26	GND
27	Analog output nb.2
28	GND
29	On/Off input nb.1
30	GND
31	On/Off input nb.2
32	GND
33	CAN Link Low
34	CAN Link High
35	RS485 Link B
36	RS485 Link A

5.1.3.2 End line configuration panel for CAN and RS485 links



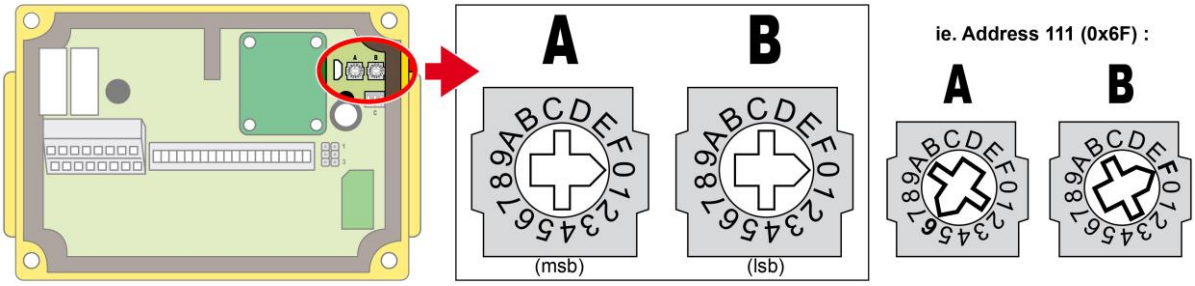
5.1.3.3 CAN link configuration : Addressing

2 rotary switches allow to assign a slave address for the Transceiver Timo.

The programmable address range is **1** to **127**.
The address must be set in hexadecimal by the two rotary switches (with **rotary switch A** = MSB).

By default, these rotary switches are on “0” position.

IMPORTANT :
Rotary switches setting must be performed when the transceiver is powered off, all setting will be taking into account when Timo Transceiver will be powered up.



When the rotary switches are on “0” position when the Transceiver is powered up, the transceiver seeks application parameters related to the CAN bus :
- if these parameters exist, they are taken into account (as determined by the configuration sheet or changed using software iDialog).
- if no configuration is saved, the default address is 10 (0xA).

If an address is set greater than 127 (ie 128 (0x80)), the Transceiver Timo indicates a programming error by a flash of **LD1** red indicator light at power on. Then, the transceiver seeks application parameters related to the CAN bus :
- if these parameters exist, they are taken into account (as determined by the configuration sheet or changed using software iDialog).
- if no configuration is saved, the default address is 10 (0xA).

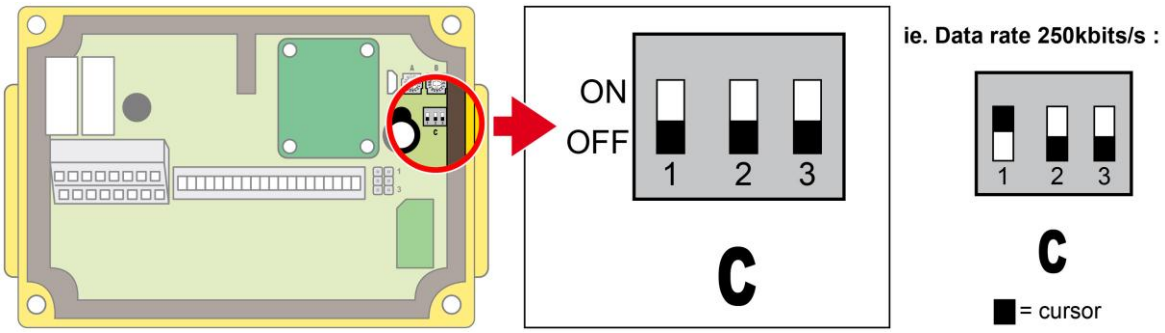
5.1.3.4 CAN link configuration : data rate

A DIP switch with 3 micro switches (2 positions) allow to configure the communication rate of the Transceiver Timo.

IMPORTANT :
Setting the DIP switch must be performed when Transceiver is powered off, all cursor positions will be taken into account when the transceiver Timo will be powered up.

Tableau des valeurs en fonction des positions des curseurs :

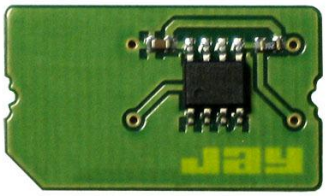
Data rate	Cursor "1"	Cursor "2"	Cursor "3"
Non assigned	OFF	OFF	OFF
20 kbits/s	OFF	OFF	ON
50 kbits/s	OFF	ON	OFF
100 kbits/s	OFF	ON	ON
250 kbits/s	ON	OFF	OFF
500 kbits/s	ON	OFF	ON
800 kbits/s	ON	ON	OFF
1000 kbits/s	ON	ON	ON



When cursors are on "0" positions when the Transceiver is powered up, the transceiver seeks application parameters related to the CAN bus :
- If these parameters exist, they are taken into account (as determined by the configuration sheet or changed using software iDialog).
- If no configuration is saved, the default data rate is 125 Kbits/s.

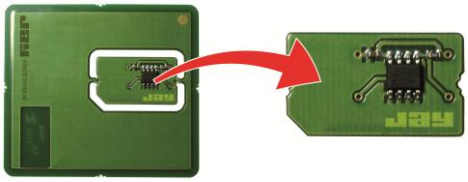
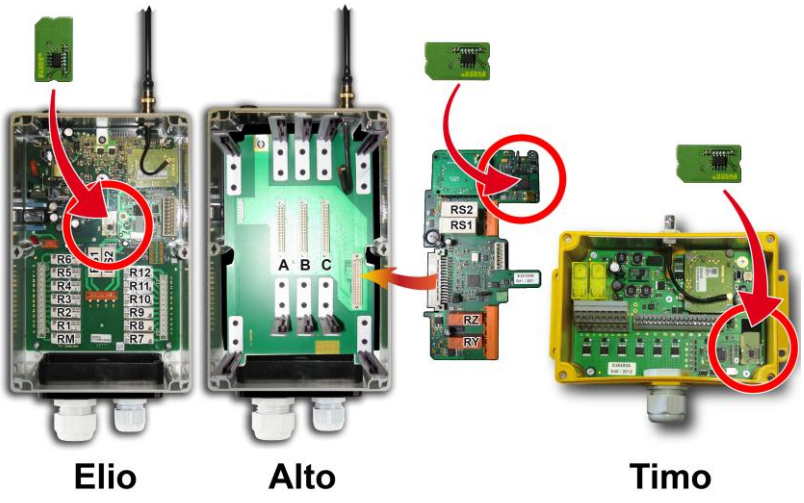
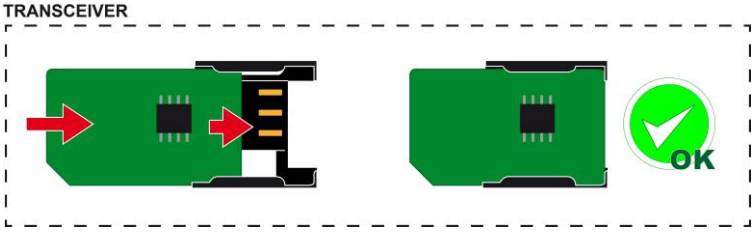
5.2 SIM card

A **SIM** card is supplied with the Transceiver.
The **SIM** card contains the configuration corresponding to the radio-controlled application. This memory is called the « application memory ».
The radio control system **cannot operate without the « application memory »**.



On delivery, the **SIM** card must be installed in the Transceiver on a specific connector of the management board.

TO AVOID ANY RISK OF ELECTROCUTION, NEVER OPEN THE TRANSCEIVER HOUSING WHICH IS POWERED UP.
The opening of the housing must be done by ensuring that the power supply cables and control cables are out of voltage

1	**Detach the SIM card from its holder**	
2	**Locate SIM connector on Transceiver board**	
3	**Insert the SIM card into the SIM connector**	

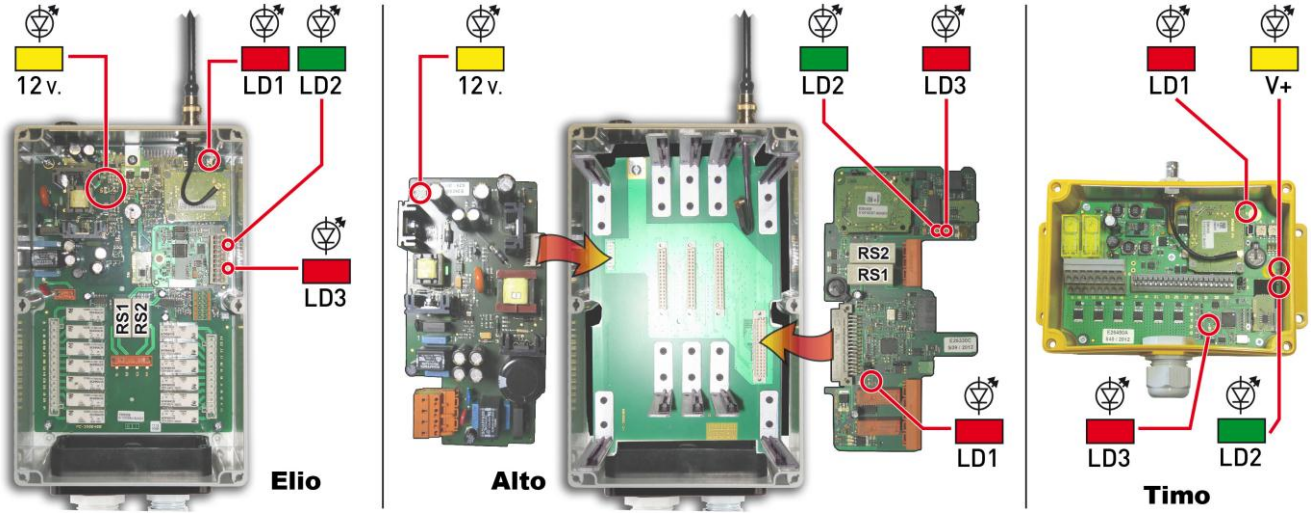
5.3 USB connection

Using the USB connection is possible only when the transceiver is powered off.

TO AVOID ANY RISK OF ELECTROCUTION, NEVER OPEN THE TRANSCEIVER HOUSING WHICH IS POWERED UP.

The opening of the housing must be done by ensuring that the power supply cables and control cables are out of voltage

5.4 Transceiver indicator light functions and messages



Safe Mode = The Transceiver is energized, and standby for a « Start » order
Operating mode = The Transceiver is started, its safety relays **RS1** and **RS2** are activated and their contacts are closed

Messages in nominal operating condition :

Mode	LD1 (red)	LD3 (red)	LD2 (green)	12V Power V+ Power (yellow)	Description
Safe	OFF	OFF	OFF	ON	Nominal operating state
Safe	OFF	OFF	Flashing	ON	The Transceiver is in "Association" mode
Safe	Flashing with pauses for a second	OFF	Flashing with pauses for a second	ON	The transceiver is in configuration mode with the Operator module
Operating	OFF	OFF	ON and OFF for a short period (once per second)	ON	Nominal operating state

Messages in case of errors or operating problems :

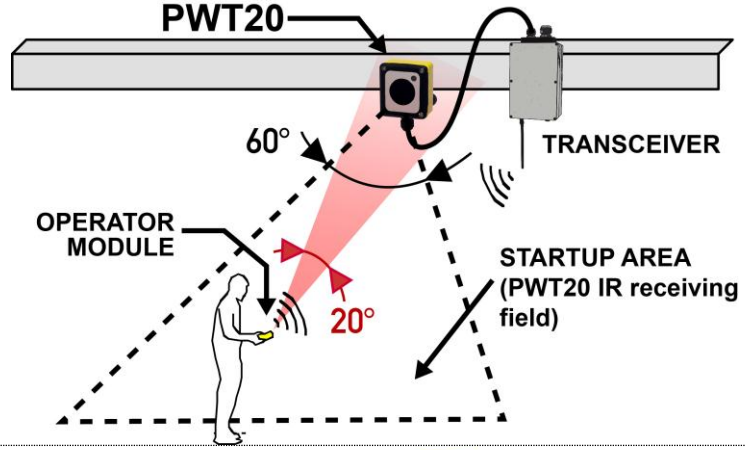
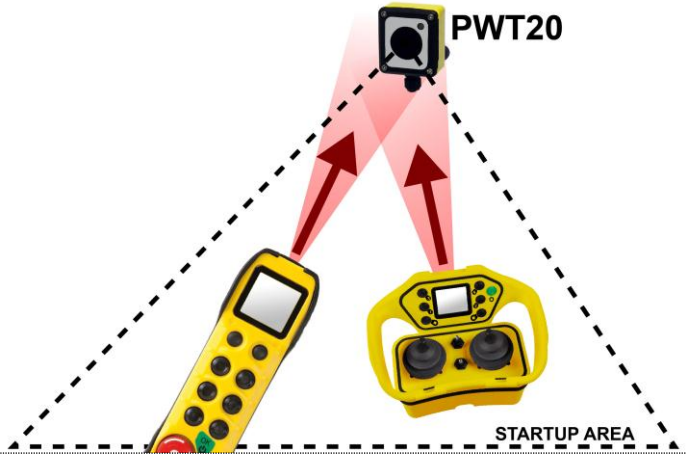
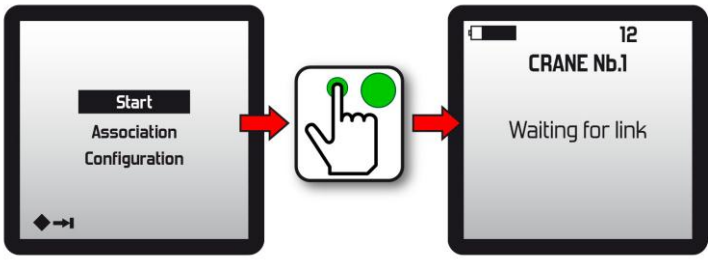
Mode	LD1 (red)	LD3 (red)	LD2 (green)	12V Power V+ Power (yellow)	Description
when powering up	OFF	OFF	OFF	OFF	Power problem, check fuse(s) or power cables
when powering up	On for a few seconds	On for a few seconds	OFF	ON	Material error or incorrect settings, not possible to start
when powering up (Transceiver Timo)	Flash	OFF	OFF	ON	Error on manual address programming for CANopen BUS
Safe	OFF	OFF	Fast flashing	ON	Radio frames receiving with an unrecognized ID code
Operating	OFF	OFF	Irregular extinctions	ON	Radio transmission degraded
All	Flashing	Flashing	OFF	ON	Blocking fault (safety relays, power supply, microcontroller failure ...)
All	ON	ON	OFF	ON	Software bug

6 Options

6.1 « Start-up by infrared validation » function

The start-up area of an equipment and the equipment's identification can be secured by an infrared validation on start-up.

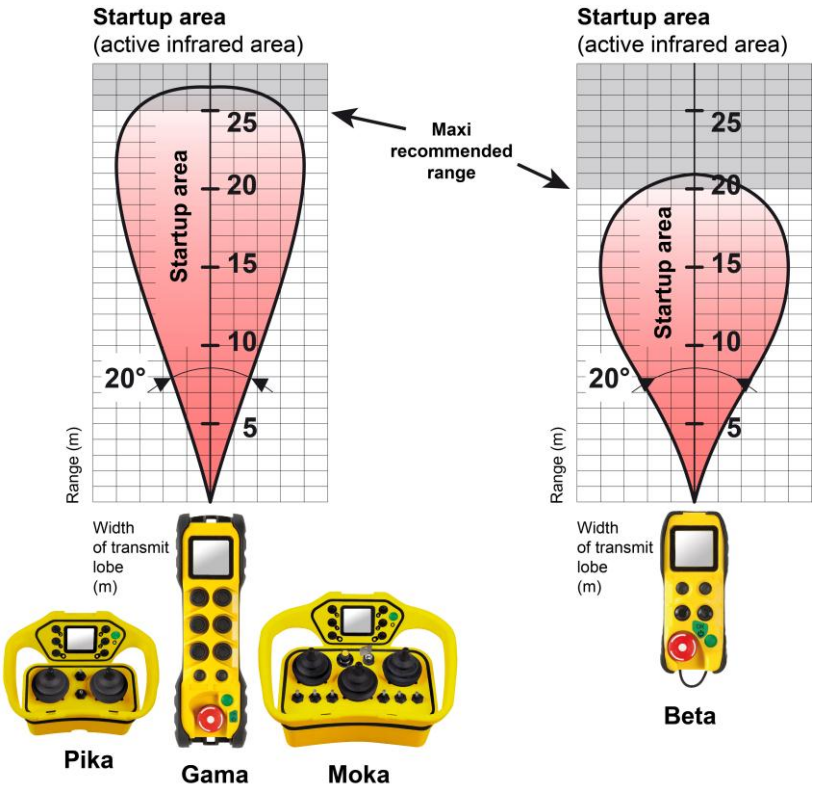
To start up the equipment, the user must :

1	**Take position in the infrared reception area of one of the PWT20 modules (called «Startup area»)**	
2	**point the operator module in the direction of the PWT20 IR module(s) mounted on the equipment to be controlled**	
3	**validerSelect the « Start » menu on the operator module screen and press the green « On » pushbutton**	

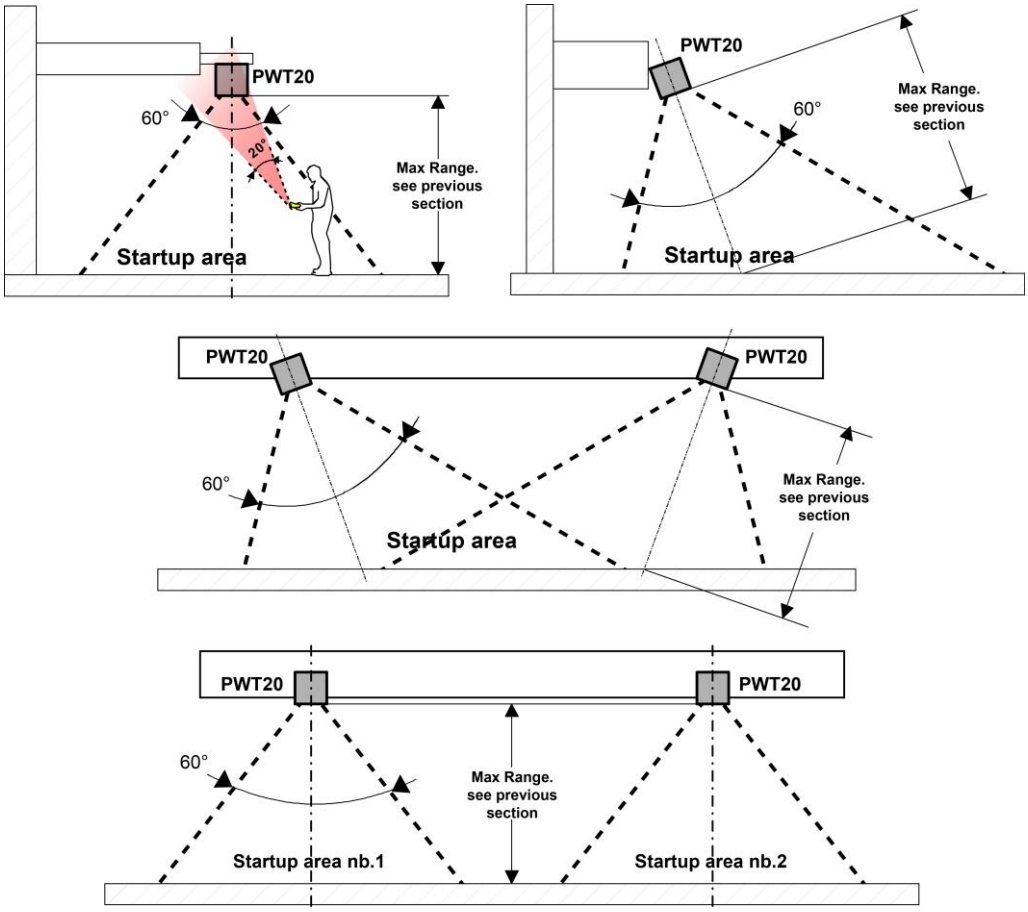
Once the validation has been performed, the «Operator module and the Equipment to be controlled» are matched up with no possibility for error. The operator can then move freely with no limitation.

- Up to 3 IR **PWT20** modules can be connected to the Transceiver.

- The infrared startup function has a range of action described in the tables below :



6.1.1 Examples of PWT20 IR modules positioning

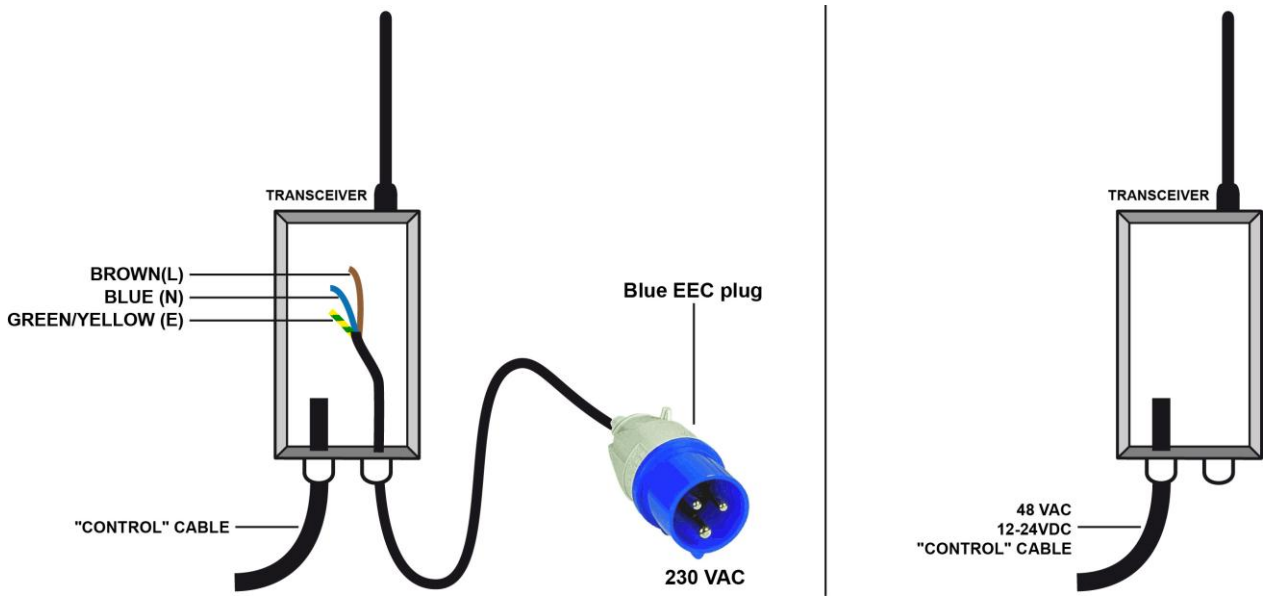


7 Instructions for installation and commissioning

7.1 Instructions for electrical connection of the transceiver

IMPORTANT :
IF TRANSCEIVER IS DIRECTLY SUPPLIED FROM THE NETWORK DISTRIBUTION, THE SCHEMA OF THE POWER SUPPLY NETWORK TYPE "**IT**"- SHALL NOT BE USED TO SUPPLY THE TRANSCEIVER.

- To avoid any risks of electrocution, don't open the Transceiver housing when powered. The opening of the housing must be done by ensuring that the power supply cables and control cables are out of voltage.
- The Transceiver power supply circuit must be directly related to the power supply circuit of the radio-controlled equipment.
- The Transceiver power supply circuit must have appropriate separation means (fuse (s) or circuit breaker) or benefit from the power supply circuit of radio-controlled equipment.
- When the Transceiver is supplied with 230 VAC, the power cable shall be separated from the "control" cable.
  In the case of use of EEC-type electrical plug, the color of the plug shall be "BLUE".

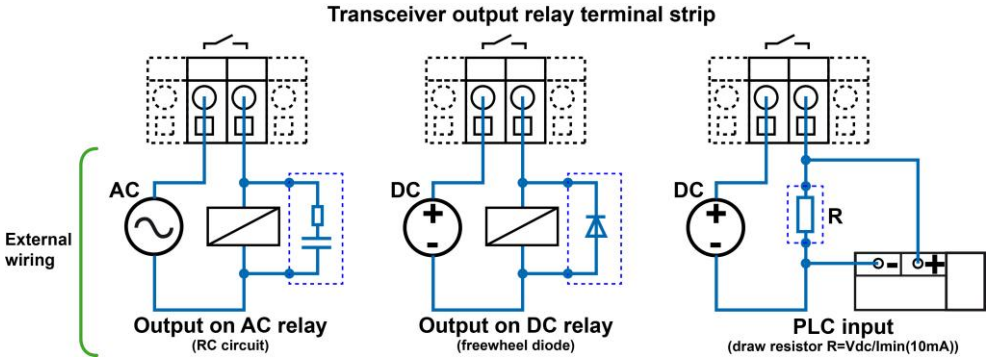


- In cable path, power cables should be separated from the control cables, by observing a minimum spacing (20 cm) between the various classes :
  - **Class 1 :** Radio, analogue signals
  - **Class 2 :** Mains for supply of various components,
  - **Class 3 :** Power control of motors, variable speed drives, etc....

  If only one cable path is available, the cables of different classes should be separated as much as possible
- To maintain the reinforced insulation inside the Transceiver housing, it is mandatory to increase the insulation of cables carrying high voltages with insulating sleeves.
- Be sure not to exceed the minimum and maximum characteristics specified in «Technical characteristics/Transceivers» section, by installing, if necessary, an additional load or intermediate relays (auxiliary contacts in electrical control cabinet for power control, for example).

- **Interference suppression of the electrical installation and protection of the power supply :**
  In the event of inductive loads on the Transceiver relay outputs (contactor coils, solenoid valves or electro-brakes), interference suppression devices such as capacitors, RC circuits, diodes, etc. must be placed directly at the terminals of the controlled components using the shortest possible connections.
  A draw resistor should also be used on the controller inputs.

  Examples of protection system to be used :



7.2 Connecting the power supply

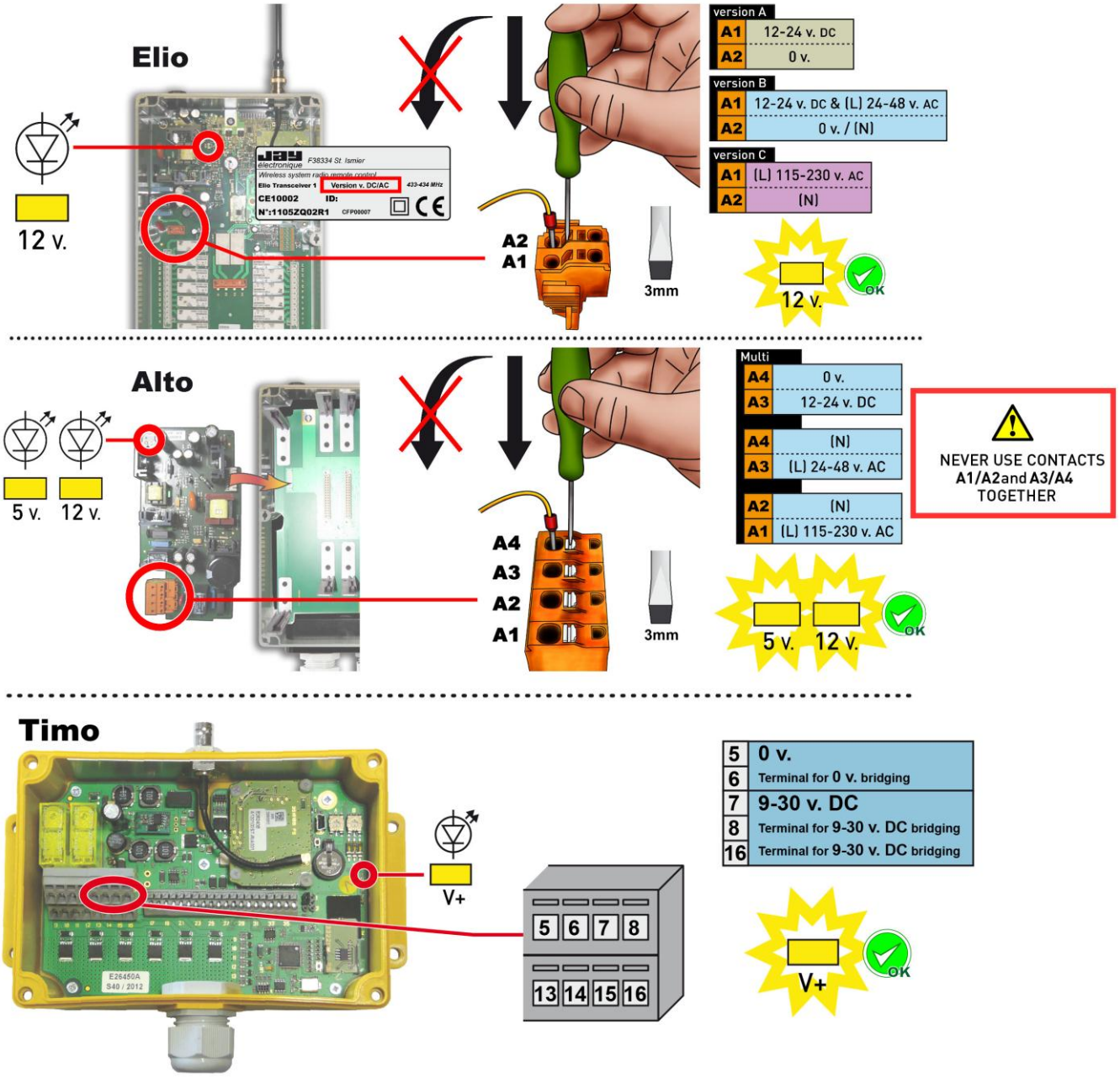
TO AVOID ANY RISK OF ELECTROCUTION, NEVER OPEN THE TRANSCEIVER HOUSING WHICH IS POWERED UP.

The opening of the housing must be done by ensuring that the power supply cables and control cables are out of voltage

If flexible stranded wire is used, crimped terminations must be used to avoid false contacts and short circuits.

To open the connection terminal strips :

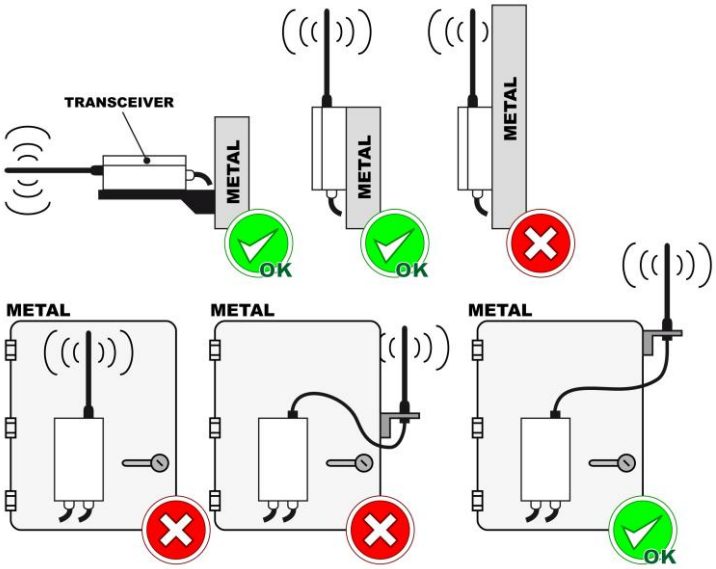
1) Vertically push the screwdriver (flat tip screwdriver of 1.5 to 3 mm width) on the slot.
2) Exercise a moderated pressure up to opening the terminal
3) Insert the wire,
4) Remove the screwdriver



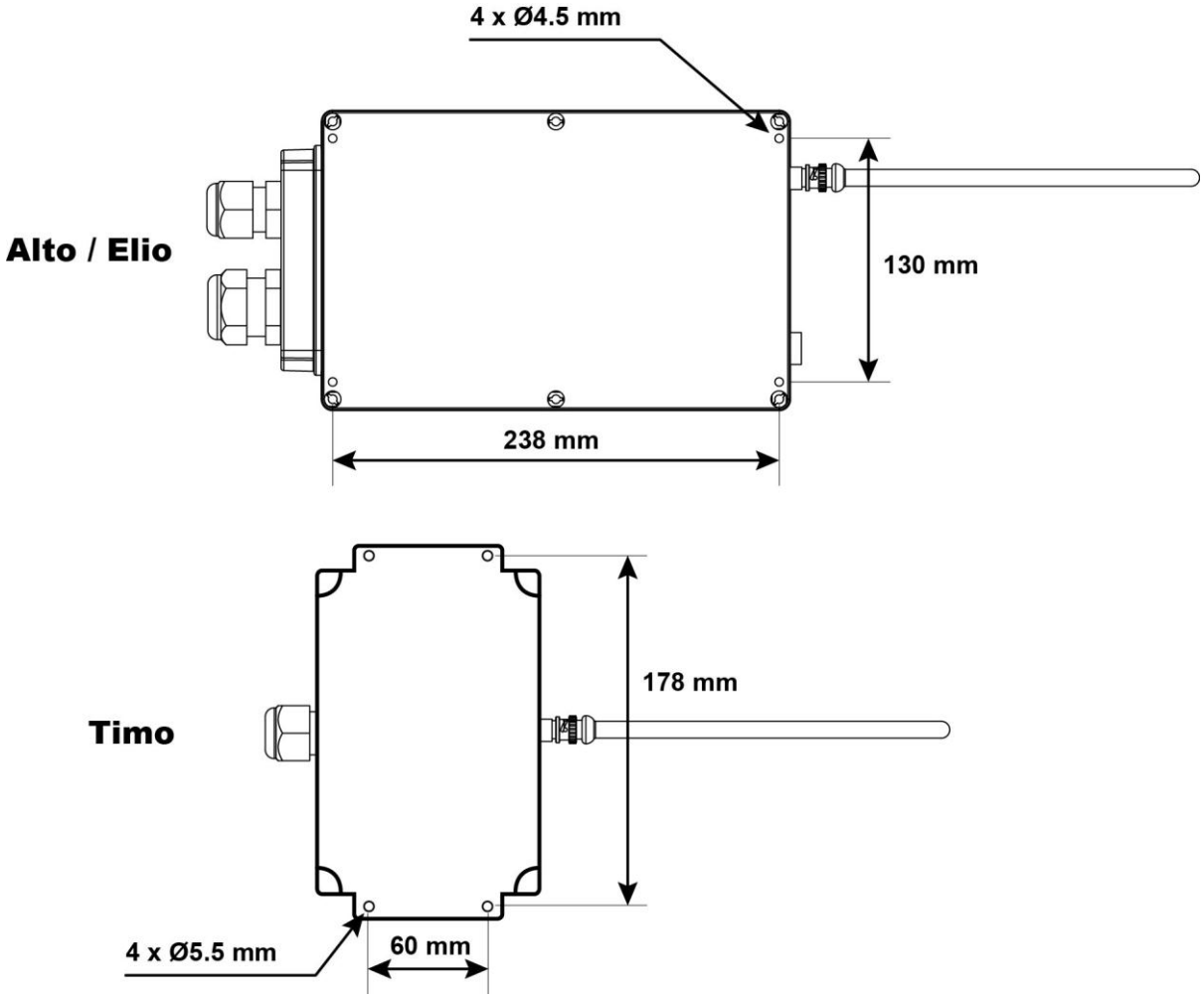
7.3 Installing the Transceiver

- Transceiver cable entries are done through cable glands M25 and M32. These cable glands are designed to tightness and anchor the cable (compliant with EN 50262). The compliance shall require the use of cables of 16mm to 21mm diameter and the application of torques: for M25 “5 to 7.5 Nm” for M32 “ 7.5 to 10Nm”.
- The Transceiver must be installed in a location which is sheltered from impacts and weather, in an area which is easy to access.
- The antenna must be installed at a distance from the class 3 cables and power components (power supply, motor, variable speed drives …) while remaining in an area which is favourable to radio reception.
- The Transceiver must be located at a height, above the operator using the transmitter, with the antenna directed downward.
- No metal object which could form a screen should be located between the operator and the antenna (risk of communication cut-out).

7.3.1 Positioning the Transceiver :



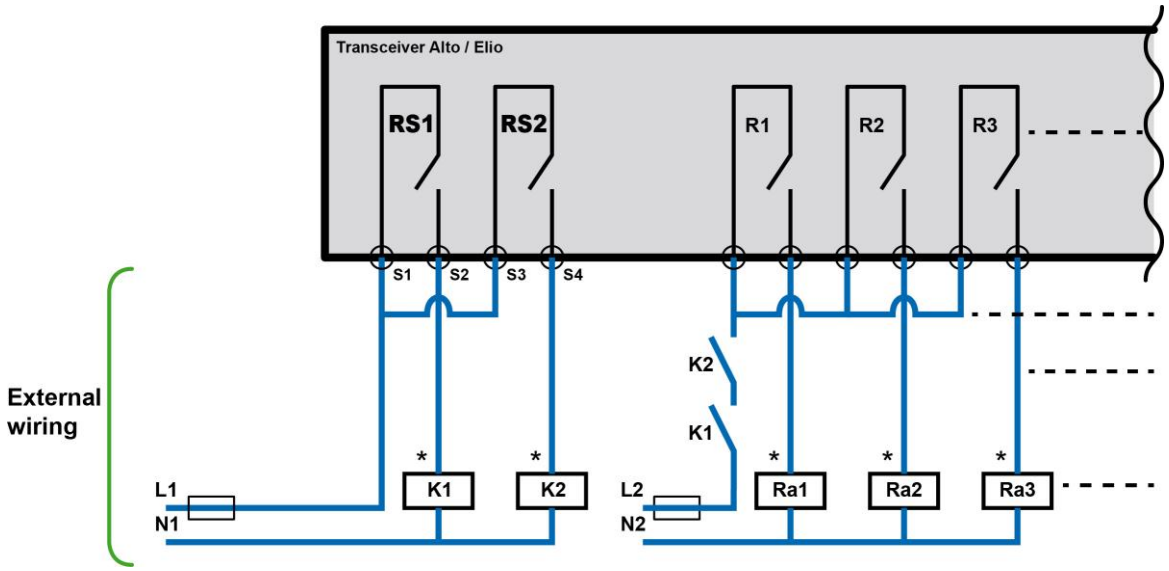
7.3.2 Mounting the Transceiver :



- The installer must fit the equipment to be radio-controlled with appropriate references with respect to the operator module control components and the movements or functions of the equipment.

7.4 Wiring diagram : use of safety relays RS1 and RS2

The safety relays RS1 and RS2 are used to interrupt the common control line of the radio-controlled equipment :



K1 and **K2** are guided contact contactors, to be integrated in the safety circuit of the system controlled.

The 2 safety relays RS1 and RS2 are activated when radio communication is set up between the operator modules and the Transceiver, and are automatically maintained up to the moment of active or passive shutdown (action on palmswitch, loss of radio link, battery discharged, “Standby” time elapsed …)

*** =** The use of overvoltage limiting circuits will increase the service life of the relay contacts (ex: RC circuits with AC, diodes + Zener with DC, etc.)

7.5 Instructions for commissioning

- Before commissioning, the installer must perform a final check to make sure of the match-up between the control components of the operator module and the relays (or solid state outputs) of the desired Transceiver.
- During the previous check, the installer must check that when the green "On/Horn" button is pressed on startup, only the safety relays are in the "ON" state.
- **Verify the priority general shutdown mode** (remote control in operation and radio link established) :

  Active stop : When the stop palmswitch button on the operator module is pressed, the Transceiver safety relays (RS1 and RS2) should instantaneously change state.

  Passive stop : When the battery is removed from the operator module in operation, the Transceiver safety relays (RS1 and RS2) should change state within two seconds max..

- **If an electostaticdischarge occurs on antenna plug, communication could be lost, OFF and ON of power supply is necessary for restart normally the product.** Be sure that all ESD (electrical charges) you can wear are grounded before connecting antenna. Always touch a metallic grounded structure prior to touching antenna connector.

8 Maintenance

The spare parts are only accessible to persons having been appropriately trained by JAY Electronique at its training centre.

8.1 Replacement of an operator module or of a Transceiver

8.1.1 Operator modules

In the event of an operator module failure, a backup operator module can be used. To do so, perform the procedure detailed in the "**Association**" menu.

Validate the selected Transceiver; the configuration of the previous operator module used is recovered and your replacement operator module is ready to operate.

8.1.2 Transceiver

The Transceiver is equipped with a **SIM** card which can be disconnected from the management board. The SIM card contains all the configuration parameters. In the event of a failure, the card can be removed and placed in a replacement Transceiver having the same configuration (additional boards for Alto and daughter board for **Elio**).

TO AVOID ANY RISK OF ELECTROCUTION, NEVER OPEN THE TRANSCEIVER HOUSING WHICH IS POWERED UP.
The opening of the housing must be done by ensuring that the power supply cables and control cables are out of voltage

8.2 USB connector

The Operator module and the Transceiver are equipped with a mini-B USB interface. Using the **iDialog** software, this interface will allow you to display and modify the system configuration parameters. To access this connector, you must open the Transceiver unit.

TO AVOID ANY RISK OF ELECTROCUTION, NEVER OPEN THE TRANSCEIVER HOUSING WHICH IS POWERED UP.
The opening of the housing must be done by ensuring that the power supply cables and control cables are out of voltage

8.3 Chargers

8.3.1 Indicator light on support chargers does not come on

Power supply problem (check the voltage adapter and the connection to the support charger).

8.3.2 Operator module does not charge on its support charger

Check that the contacts on the support charger are clean.

9 Inspection and servicing

BEFORE PERFORMING ANY SERVICING OPERATION, SWITCH OFF THE MAIN POWER SUPPLY OF THE CONTROL SYSTEM (charger included)

9.1 Inspection and servicing of operator module

The operator module housing must not be opened.

If one of the membranes of the function buttons or the seal of the operator module is damaged, the product must not be any more used until replacement of these tightness spare parts.

In opposite case, any liquid, any dust or any foreign body can damage the operator module.

The attention of the user is attracted to the risks of the use of the remote control in an environment containing solvents of polymers or glues which can degrade the good functioning of operator module mechanical organs.

Verify regularly the good state of the transmitter, paying a special attention to the function button membranes, to the electronic key connector and to the battery.

Clean the operator module by eliminating any foreign body.
Only use non aggressive cleaning product on base of soapy solution.

9.2 Inspection and servicing of charger

The attention of the user is attracted to the risks of the use of the remote control in an environment containing solvents of polymers or glues which can degrade the good functioning of support chargers mechanical organs.

Clean the charger by eliminating any foreign body.
Only use non aggressive cleaning product on base of soapy solution.

Check that the battery compartment remains clean and dry.

9.3 Inspection and servicing of Transceiver

The Transceiver can be dismantled only by a trained staff, in a "controlled" environment, spare parts can be changed only by identical and original parts..

Check the antenna connection and check that it is clean and free of any oxidation.

Check the wiring of Transmitter to electrical unit on power supply and machine, and wiring of function outputs.

Check the correct operation of stop circuits, active and passive.

Check the condition of cover seal, tightening of screws and cable glands.

Clean the Transceiver by eliminating any foreign body.
Only use non aggressive cleaning product on base of soapy solution.

10 Technical characteristics

10.1 Operator modules

	Beta	Gama	Pika	Moka
Housing material	shock-resistant reinforced ABS		shock-proof polyamide	
Tightness	IP65			
Weight (with battery)	2 bts : 400 g 6 bts : 485 g	6 bts : 768 g 10 bts : 893g	1 Joystick : 1300 g 2 Joysticks : 1400 g	1800g max
Dimensions	2 bts : 182 x 75 x 50 mm 6 bts : 235 x 75 x 50 mm	6 bts : 290 x 93 x 64 mm 10 bts : 360 x 93 x 64 mm	243 x 180 x 170 mm	297 x 215 x 170 mm
Operating temperature range	-20°C to + 50°C			
Storage temperature range of housing alone	-20°C to + 70°C			
Storage temperature range of battery	-20°C to + 50°C			
Power supply	Li-ion battery			
Endurance (25°C) of radio link, activated	10 hours			
Frequencies on 433-434MHz bands	64 frequencies			
Frequencies on 869MHz band	12 frequencies			
Transmit power (PAR)	< 10 mW (license free)			
Range limitation	10 power levels, configurable			
Modulation	FM			
Average range in industrial space (1)	100 m			
Average range in open space (1)	300 m			
Charging time (endurance > 80%)	3 Hours (20 mn of charge get 1h autonomy)			
Charging temperature range	0°C to + 40°C			
Display	Backlit LCD display, 128 x 128 pixels, BLACK/WHITE			
USB interface (2)	mini-B 5-point USB connector (configuration and diagnostics)			
Emergency stop	2 positions with rotary unlock system			

(1) = Range will vary according to environment conditions of operator module and reception antenna (metal frameworks, walls …).
(2) = Diagnostics and programming is performed using the **iDialog** software (option)

10.2 Transceivers

	Elio	Alto	Timo
Housing material	ABS		Polyamide-fiberglass
Tightness	IP65		
Weight	2 Kg (approx.)		585g (approx.)
Dimensions (not including antenna)	160 x 250 x 90 mm	160 x 250 x 120 mm	190 x 120 x 60 mm
Operating temperature range	-20°C to + 60°C		
Storage temperature range	-30°C to + 70°C		
Cable lead-out	by 2 cable glands (size M32/M25) or by plug-in connector, 32, 40 or 72 contacts		- 1 or more cable glands - Plug-in industrial connector 10 or 16 points - Circular connector M12 or C16
Frequencies on 433-434MHz bands	64 frequencies		
Frequencies on 869MHz band	12 frequencies		
Transmit power (PAR)	<10 mW		
Modulation	FM		
Antenna	plug-in type, 1/4 Wave ref.:**VUB084**		Internal antenna (optional external antenna on BNC connector)
Average range in industrial space (1)	100 m		250 m (external antenna - option)
Average range in open space (1)	300 m		100 m (internal antenna) / 300 (external antenna option)
Power supply	**Power supply voltage (following Elio version) :** **Version A :** 12-24VDC (10,5VDC to 30VDC) **Version B :** 12-24VDC (11,4VDC to 30VDC) / 24-48VAC (+/- 25%) **Version C :** 115-230VAC (+/- 15%)	115-230VAC (+/- 15%) 24-48VAC (+/- 25%) 12-24VDC (+/- 15%)	9 to 30 VDC
	Internal protection of the power supply: Against polarity inversions for DC versions Against overcurrents by fuse : T 3,15A (DC), T 500mA (AC)		
Maximum consumption	10 W	20 W	4 W
Response time	**On startup :** 0,5s max **On command :** 300ms max	See characteristics of additional boards	**On startup :** 0,5s max **On command :** 300ms max
Stop times	**Active :** 100 ms **Passive :** adjustable from 0,5 to 2s (**IDialog**)		
USB Interface (2)	mini-B 5-point USB connector (configuration and diagnostics with **IDialog**)		
Safety relays RS1 and RS2 characterisitcs	Relays with linked contacts • Contacts : AgNi10+Au5µm • Maximum power at cosphi=1 : 2000 VA • Maximum permissible current (at 20°C) : 8 A • Maximum voltage switching : 250 VAC • Minimum current / voltage advised switching : 50 mA / 12 VDC • Electrical life : 100 000 switching cycles at 250 VAC, 6A, cosphi=1 • Tests per EN 60947-5-1 : DC13 at 2 A / 24 VDC - AC15 at 1 A / 230VAC		Relays with linked contacts • Contacts : AgNi10+Au5µm • Max. permissible current (at 20°C) : 8 A • Max. voltage switching : 30 VDC • Min. current / voltage advised switching : 50 mA / 12 VDC • Tests per EN 60947-5-1 : DC13 at 2 A / 24 VDC
Function relays characteristics	2 connection points, potential free, by contact Spring-type plug-in connectors **Function relays :** 1 «ON» relay + 12 function relays Independent NO relays • Category DC13 0,5A / 24VDC , AC15 2A / 230VAC • Interrupting capacity max. 2000VA • Max. current 8A • Min. current 10 mA (12 Vmin.) • Max. voltage 250VAC • 100 000 switching cycles at 250 VAC, 8A, cosphi=1	See characteristics of additional boards	No relay output See characteristics of Inputs/Ouputs and features on next page

(1) = Range will vary according to environment conditions of operator module and reception antenna (metal frameworks, walls …).
(2) = Diagnostics and programming is performed using the **iDialog** software (option)

10.2.1 Transceiver Alto : Control board characteristics

ELECTRICAL CHARACTERISTICS OF CONTROL BOARD

Contact type	2 relays with linked contacts
Contacts and connection	3 connection points, 1 Contact Spring-type plug-in connectors
Indication	- 1 green indicator light : Radio status and quality - 1 yellow indicator light : Power on - 1 red indicator light : fault and diagnostic

ON CONTROL BOARD (OPTIONS)

1 ON/OFF input

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
1 active input consumption	< 10mA
Voltage	0 to 30VDC
Lowlevel on input	< 2VDC
Highlevel on input	> 3VDC

1 Analog input

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Max. input level	10V or 4-20mA
1 active input consumption	< 12mA

1 RS485 serial link

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors

STARTUP BY IR VALIDATION

ACTION AREA LIMITATION BY INFRARED

10.2.2 Transceiver Alto : Additional board characteristics

ELECTRICAL CHARACTERISTICS OF BOARD WITH 12 CONTROL RELAY OUTPUTS

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Outputs	Independent relays - Category DC13 0,5A / 24VDC , AC15 2A / 230VAC - Interrupting capacity, 2000VA max. - Max. current 8A (control relay), 6A (safety relay) - Min. current 10 mA (12 Vmin.) - Max. voltage 250VAC
Response time	- On startup : 0,5s max - On command : 200ms typical

ELECTRICAL CHARACTERISTICS OF BOARD WITH 12 ON/OFF INPUTS + 2 ANALOGUE INPUTS

Optocoupler inputs

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Consumption of an active input	< 10mA
Voltage	0 to 30VDC
Low level on input	< 2Vdc
High level on input	> 3Vdc

Analogue inputs

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Max. input level	10V or 4-20mA
Consumption of an active input	< 12mA

Each +12V Outputs is limited to 50mA

ELECTRICAL CHARACTERISTICS OF BOARD WITH 6 ANALOGUE OUTPUTS + 1 BYPASS OUTPUT

Analogue outputs

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Output level	0 / 10V -10V / 0 / +10V 3V / 6V / 9V 6V / 12V / 18V
Voltage output max. current	10mA

ELECTRICAL CHARACTERISTICS OF BOARD WITH 18 STATIC OUTPUTS

Transistor outputs

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Max. continuous control voltage	30Vdc
Max. output current (with 24Vdc)	100 mA
Min. current (controller input)	5 mA
Max. current (controller output)	120mA

ELECTRICAL CHARACTERISTICS OF BOARD WITH OUTPUT BUS

MODBUS

10.2.3 Transceiver Timo : Inputs/Outputs and features

AVAILABLE FUNCTIONS	
Transistor outputs	
Connection	1 connection point per output + 1 power supply common spring-type terminal block
Outputs	- Max. switching : 4A / output - Max. permissible power for all outputs 12A - Max. voltage 30VDC - PWM (frequency 1 to 300Hz, duty cycle 1 to 90%)
On/Off inputs	
High level on input	→ 3 VDC
Low level on input	← 2 VDC
Voltage	0-30Vdc Max Spring-type terminal block 2 connection points per input
Consumption of an active input	← 20mA
Analog outputs	- 1 connection point per output + common connection - Spring-type terminal block
Signal type	0-10V or ¼ at ¾ max reference voltage from 30VDC
Max output current	← 10mA
Analog inputs	- 1 connection point per output + common - Spring-type terminal block
Signal type	0-30V
Consumption of an active input :	← 10mA
Modbus serial link	- 1 RS 485 serial link : - 2 connection points on spring-type terminal block
(D+/D-) protection	ESD/EMI
CANopen Bus	- CIA401 compatible - Data rate 20, 50, 100, 125, 250, 500, 800Kbit/s et 1Mbit/s - Slave addressing 1 to 127
Modbus	
Data rate	1200, 2400, 4800, 9600, 19200 (default), 38400, 57600, 115200 bit/s
Parity	- none - even (default) - odd
Slave addressing	1 to 247 (100 by default)

11 Warranty

All our products are guaranteed two years as of date of product manufacture (indicated on product), excluding wear parts. For the battery, the warranty period is limited to 1 year. Repair, modification or replacement of a device during the warranty period may not have the effect of extending the warranty period.

Limits of warranty :

The warranty does not cover defects resulting from :

- Transport,
- False manoeuvre or non-observance of connection diagrams when setting the equipment into service,
- Insufficient supervision or servicing, utilization not complying with the specifications detailed in the technical manual and, as a general rule, storage, operation or environment conditions (atmospheric, chemical, electrical or other conditions).
- Conditions not specified on order of the equipment

The warranty shall not apply subsequent to any modifications or additions to the equipment performed by the customer without written approval by JAY Electronique.

The JAY Electronique responsibility during the warranty period is limited to material and construction defects. This warranty comprises repair in the JAY workshops or replacement, free of charge, of parts recognized to be defective following expert inspection by the Jay Technical Department.

The warranty shall not give rise to any compensation for damage claims

Any disputes relative to a supply or settlement thereof shall be ruled by the COURT OF COMMERCE OF GRENOBLE, solely competent, even in the event of an Appeal or a plurality of defendants.

12 CE – Declaration of conformity

12.1 Beta - CE Declaration of conformity

Translated from French

CE DECLARATION OF CONFORMITY

The manufacturer :

JAY Electronique
ZAC la Bâtie, rue Champrond
38334 ST ISMIER Cedex
FRANCE

Serial number of the product on original

Declares that the operator module unit and its charger described in the user manual and mentioned here below:

BETA

xxBxxxxx / PWCBxxx

comply :

• With the requirements specified for the machines defined in Appendix I of the Directive 2006/42/EC concerning alignment of the legislation of the member states relative to machinery.

To this end, the notified body No. NB 0044 :

TÜV NORD CERT GmbH
Langemarckstraße 20
45141 Essen
Germany

has issued an EC type examination n°**44 205 11 382580 001** reflecting compliance with the following standards:

- EN ISO 13849-1 (2008) Requirements for performance level PL e (Category 4)
- EN ISO 13849-2 (2008) Validation
- EN 61508-1-7 (2010) Requirements for SIL 3
- EN 62061 (2005) Requirements for SIL 3
- EN 60204-1 (2007) paragraph 9.2.2 category 0
- EN 13557+A2 (2008) paragraph 5.1 ; 5.2.3 and appendix C.
- EN ISO 13850 (2008) paragraph 4.1.4
- EN 60950-1 (2006)

This equipment can be used in applications up to Category 4 (PL e) according to EN ISO 13849-1 and SIL 3 according to EN 62061. For its emergency stop, when combined with appropriate transceiver module.

- With the requirements of the European Directives of the Council of Europe of March 9th 1999, concerning alignment of the legislations of the member states, relative to radio equipment and telecommunication terminals (**R&TTE 99/5/CE dated 9 March 1999**) with special reference to:
  - article 3.1a concerning the requirements relative to health and safety protection, with reference to standards EN 50371 (2001) and EN 50178 (1997).
  - article 3.1b concerning the requirements relative to protection with respect to electromagnetic compatibility, with reference to standards ETS EN 301 489/-1 (V1.6.1-2005) /-3 (V1.4.1-2001) ; EN 61000-6-2 (2005) ; EN 62061 (2005).
  - article 3.2, concerning the requirements relative to proper use of the radio frequency spectrum to prevent harmful interferences, with reference to standards EN 300 220-1 (V2.1.2).

To this end, the notified body n°0573:

AEMC Lab
19, rue François Blumet
ZI de l'Argentière
38330 SASSENAGE
FRANCE

Conducted testing of the above operator module unit for Electromagnetic Compatibility (3.1b) and for compliance with the spectrum (3.2) included in the reports n° **R1110368C3-E**, and n° **R1110368R3-E**.

- With the requirements of the European Directive of the Council of 27 January 2003 on the restriction of use of certain hazardous substances in electrical and electronic equipment (RoHS) (2002/95/EC).
- With the requirements of the European Directive of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) Directive (2002/96/EC).

Signatory: Responsible person authorized to compile the technical file (2006/42 Annex II § 2), and empowered to draw up the declaration on behalf of the manufacturer (2006/42 Annex II § 10).
Name: Jean Bernard GIVET; **Function:** Chief Scientist.
Place and Date: JAY Electronique ZAC Bâtie Street Champrond 38334 St Ismier France on 17/09/2012

Signature : *signed on original*

351900A-revision02-Beta-Declarations_CE_de_conformite-FR_EN_DE.doc

12.2 Gama - CE Declaration of conformity

Translated from French

CE DECLARATION OF CONFORMITY

The manufacturer :

JAY Electronique
ZAC la Bâtie, rue Champrond
38334 ST ISMIER Cedex
FRANCE

Serial number of the product on original

Declares that the operator module unit and its charger described in the user manual and mentioned here below:

GAMA

xxGxxxxx / PWCGxxx

comply :

• With the requirements specified for the machines defined in Appendix I of the Directive 2006/42/EC concerning alignment of the legislation of the member states relative to machinery.

To this end, the notified body No. NB 0044 :

TÜV NORD CERT GmbH
Langemarckstraße 20
45141 Essen
Germany

has issued an EC type examination n°**44 205 11 382580 002** reflecting compliance with the following standards:

- EN ISO 13849-1 (2008) Requirements for performance level PL e (Category 4)
- EN ISO 13849-2 (2008) Validation
- EN 61508-1-7 (2010) Requirements for SIL 3
- EN 62061 (2005) Requirements for SIL 3
- EN 60204-1 (2007) paragraph 9.2.2 category 0.
- EN 13557+A2 (2008) paragraph 5.1 ; 5.2.3 and appendix C.
- EN ISO 13850 (2008) paragraph 4.1.4
- EN 60950-1 (2006)

This equipment can be used in applications up to Category 4 (PL e) according to EN ISO 13849-1 and SIL 3 according to EN 62061. For its emergency stop, when combined with appropriate transceiver module.
The control buttons have a level of performance (PL d) according to EN ISO 13849-1 and EN 62061 SIL 2 when the operator module is associated with appropriate transceiver module.

- With the requirements of the European Directives of the Council of Europe of March 9th 1999, concerning alignment of the legislations of the member states, relative to radio equipment and telecommunication terminals (**R&TTE 99/5/CE dated 9 March 1999**) with special reference to:
  - article 3.1a concerning the requirements relative to health and safety protection, with reference to standards EN 50371 (2001) and EN 50178 (1997).
  - article 3.1b concerning the requirements relative to protection with respect to electromagnetic compatibility, with reference to standards ETS EN 301 489/-1 (V1.6.1-2005) /-3 (V1.4.1-2001) ; EN 61000-6-2 (2005) ; EN 62061 (2005).
  - article 3.2, concerning the requirements relative to proper use of the radio frequency spectrum to prevent harmful interferences, with reference to standards EN 300 220-1 (V2.1.2).

To this end, the notified body n°0573:

AEMC Lab
19, rue François Blumet
ZI de l'Argentière
38330 SASSENAGE
FRANCE

Conducted testing of the above operator module unit for Electromagnetic Compatibility (3.1b) and for compliance with the spectrum (3.2) included in the reports n° **R1110368C2-E**, and n° **R1110368R2-E**.

- With the requirements of the European Directive of the Council of 27 January 2003 on the restriction of use of certain hazardous substances in electrical and electronic equipment (RoHS) (2002/95/EC).
- With the requirements of the European Directive of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) Directive (2002/96/EC).

Signatory: Responsible person authorized to compile the technical file (2006/42 Annex II § 2),
and empowered to draw up the declaration on behalf of the manufacturer (2006/42 Annex II § 10).
Name: Jean Bernard GIVET; Chief Scientist.
Place and Date: JAY Electronique ZAC Bâtie Street Champrond 38334 St Ismier France on 17/09/2012

Signature : *signed on original*

351901A-revision02-Gama-Declarations_CE_de_conformite-FR_EN_DE.doc

12.3 Moka - CE Declaration of conformity

Translated from French

CE DECLARATION OF CONFORMITY

The manufacturer :

JAY Electronique
ZAC la Bâtie, rue Champrond
38334 ST ISMIER Cedex
FRANCE

Serial number of the product on original

Declares that the operator module unit and its charger described in the user manual and mentioned here below:

MOKA

xMxxxxx / PWCxxxx

comply :

• With the requirements specified for the machines defined in Appendix I of the Directive 2006/42/EC concerning alignment of the legislation of the member states relative to machinery.

To this end, the notified body No. NB 0044 :

TÜV NORD CERT GmbH
Langemarckstraße 20
45141 Essen
Germany

has issued an EC type examination n° **44 205 11 382580-005** reflecting compliance with the following standards:

- EN ISO 13849-1 (2008) Requirements for performance level PL e (Category 4)
- EN ISO 13849-2 (2008) Validation
- EN 61508-1-7 (2010) Requirements for SIL 3
- EN 62061 (2005) Requirements for SIL 3
- EN 60204-1 (2007) paragraph 9.2.2 Stop category 0
- EN ISO 13850 (2008) paragraph 4.1.4 Stop category 0
- EN 13557+A2 (2008) paragraph 5.1 ; 5.2.3 and appendix C.
- EN 60950-1 (2006)

This equipment can be used in applications up to Category 4 (PL e) according to EN ISO 13849-1 and SIL 3 according to IEC 62061. For its emergency stop, when combined with appropriate transceiver module.

- With the requirements of the European Directives of the Council of Europe of March 9th 1999, concerning alignment of the legislations of the member states, relative to radio equipment and telecommunication terminals (**R&TTE 99/5/CE dated 9 March 1999**) with special reference to:
  - article 3.1a concerning the requirements relative to health and safety protection, with reference to standards EN 50371 (2001) and EN 50178 (1997).
  - article 3.1b concerning the requirements relative to protection with respect to electromagnetic compatibility, with reference to standards ETS EN 301 489/-1 (V1.6.1-2005) /-3 (V1.4.1-2001) ; EN 61000-6-2 (2005) ; EN 62061 (2005).
  - article 3.2, concerning the requirements relative to proper use of the radio frequency spectrum to prevent harmful interferences, with reference to standards EN 300 220-1 (V2.1.2).

To this end, the notified body n°0573:

AEMC Lab
19, rue François Blumet
ZI de l'Argentière
38330 SASSENAGE
FRANCE

Conducted testing of the above operator module unit for Electromagnetic Compatibility (3.1b) and for compliance with the spectrum (3.2) included in the reports n° **R1206232C3-E**, and n° **R1206232R3-E**.

- With the requirements of the European Directive of the Council of 27 January 2003 on the restriction of use of certain hazardous substances in electrical and electronic equipment (RoHS) (2002/95/EC).
- With the requirements of the European Directive of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) Directive (2002/96/EC).

Signatory: Responsible person authorized to compile the technical file (2006/42 Annex II § 2), and empowered to draw up the declaration on behalf of the manufacturer (2006/42 Annex II § 10).
Name: Jean Bernard GIVET; **Function:** Chief Scientist.
Place and Date: JAY Electronique ZAC Bâtie Street Champrond 38334 St Ismier France on 17/09/2012

Signature : *signed on original*

351902A-revision03-Moka-Declarations_CE_de_conformite-FR_EN_DE.doc

12.4 Pika - CE Declaration of conformity

Translated from French

CE DECLARATION OF CONFORMITY

The manufacturer :

JAY Electronique
ZAC la Bâtie, rue Champrond
38334 ST ISMIER Cedex
FRANCE

Serial number of the product on original

Declares that the operator module unit and its charger described in the user manual and mentioned here below:

PIKA

xPxxxxx / PWCxxxx

comply :

• With the requirements specified for the machines defined in Appendix I of the Directive 2006/42/EC concerning alignment of the legislation of the member states relative to machinery.

To this end, the notified body No. NB 0044 :

TÜV NORD CERT GmbH
Langemarckstraße 20
45141 Essen
Germany

has issued an EC type examination n° **44 205 11 382580-004** reflecting compliance with the following standards:

- EN ISO 13849-1 (2008) Requirements for performance level PL e (Category 4)
- EN ISO 13849-2 (2008) Validation
- EN 61508-1-7 (2010) Requirements for SIL 3
- EN 62061 (2005) Requirements for SIL 3
- EN 60204-1 (2007) paragraph 9.2.2 Stop category 0
- EN ISO 13850 (2008) paragraph 4.1.4 Stop category 0
- EN 13557+A2 (2008) paragraph 5.1 ; 5.2.3 and appendix C.
- EN 60950-1 (2006)

This equipment can be used in applications up to Category 4 (PL e) according to EN ISO 13849-1 and SIL 3 according to IEC 62061. For its emergency stop, when combined with appropriate transceiver module.

- With the requirements of the European Directives of the Council of Europe of March 9th 1999, concerning alignment of the legislations of the member states, relative to radio equipment and telecommunication terminals (**R&TTE 99/5/CE dated 9 March 1999**) with special reference to:
  - article 3.1a concerning the requirements relative to health and safety protection, with reference to standards EN 50371 (2001) and EN 50178 (1997).
  - article 3.1b concerning the requirements relative to protection with respect to electromagnetic compatibility, with reference to standards ETS EN 301 489/-1 (V1.6.1-2005) /-3 (V1.4.1-2001) ; EN 61000-6-2 (2005) ; EN 62061 (2005).
  - article 3.2, concerning the requirements relative to proper use of the radio frequency spectrum to prevent harmful interferences, with reference to standards EN 300 220-1 (V2.1.2).

To this end, the notified body n°0573:

AEMC Lab
19, rue François Blumet
ZI de l'Argentière
38330 SASSENAGE
FRANCE

Conducted testing of the above operator module unit for Electromagnetic Compatibility (3.1b) and for compliance with the spectrum (3.2) included in the reports n° **R1206232C3-E**, and n° **R1206232R3-E**.

- With the requirements of the European Directive of the Council of 27 January 2003 on the restriction of use of certain hazardous substances in electrical and electronic equipment (RoHS) (2002/95/EC).
- With the requirements of the European Directive of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) Directive (2002/96/EC).

Signatory: Responsible person authorized to compile the technical file (2006/42 Annex II § 2), and empowered to draw up the declaration on behalf of the manufacturer (2006/42 Annex II § 10).
Name: Jean Bernard GIVET; **Function:** Chief Scientist.
Place and Date: JAY Electronique ZAC Bâtie Street Champrond 38334 St Ismier France on 17/09/2012

Signature : *signed on original*

351903A-revision02-Pika-Declarations_CE_de_conformite-FR_EN_DE.doc

12.5 Alto - CE Declaration of conformity

Translated from French

CE DECLARATION OF CONFORMITY

The manufacturer :

JAY Electronique
ZAC la Bâtie, rue Champrond
38334 ST ISMIER Cedex
FRANCE

Serial number of the product on original

Declares that the operator module unit and its charger described in the user manual and mentioned here below:

ALTO

xAxxxxx

comply :

• With the requirements specified for the machines defined in Appendix I of the Directive 2006/42/EC concerning alignment of the legislation of the member states relative to machinery.

To this end, the notified body No. NB 0044 :

TÜV NORD CERT GmbH
Langemarckstraße 20
45141 Essen
Germany

has issued an EC type examination n° **44 205 11 382580-006** reflecting compliance with the following standards:

- EN ISO 13849-1 (2008) Requirements for performance level PL e (Category 4)
- EN ISO 13849-2 (2008) Validation
- EN 61508-1-7 (2010) Requirements for SIL 3
- EN 62061 (2005) Requirements for SIL 3
- EN 60204-1 (2007) paragraph 9.2.2 Stop category 0
- EN ISO 13850 (2008) paragraph 4.1.4 Stop category 0
- EN 13557+A2 (2008) paragraph 5.1 ; 5.2.3 and appendix C.
- EN 60950-1 (2006)

This equipment can be used in applications up to Category 4 (PL e) according to EN ISO 13849-1 and SIL 3 according to IEC 62061, for safety outputs. When combined with the appropriate operator module.
And the performance level (PL d) according to standard EN ISO 13849-1 and EN 62061 for the SIL 2 for the control buttons of GAMA operator module.

- With the requirements of the European Directives of the Council of Europe of March 9th 1999, concerning alignment of the legislations of the member states, relative to radio equipment and telecommunication terminals (**R&TTE 99/5/CE dated 9 March 1999**) with special reference to:
  - article 3.1a concerning the requirements relative to health and safety protection, with reference to standards EN 50371 (2001) and EN 50178 (1997).
  - article 3.1b concerning the requirements relative to protection with respect to electromagnetic compatibility, with reference to standards ETS EN 301 489/-1 (V1.6.1-2005) /-3 (V1.4.1-2001) ; EN 61000-6-2 (2005) ; EN 62061 (2005).
  - article 3.2, concerning the requirements relative to proper use of the radio frequency spectrum to prevent harmful interferences, with reference to standards EN 300 220-1 (V2.1.2).

To this end, the notified body n°0573:

AEMC Lab
19, rue François Blumet
ZI de l'Argentière
38330 SASSENAGE
FRANCE

Conducted testing of the above operator module unit for Electromagnetic Compatibility (3.1b) and for compliance with the spectrum (3.2) included in the reports n° **R1206232C3-E**, and n° **R1206232R3-E**.

- With the requirements of the European Directive of the Council of 27 January 2003 on the restriction of use of certain hazardous substances in electrical and electronic equipment (RoHS) (2002/95/EC).
- With the requirements of the European Directive of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) Directive (2002/96/EC).

Signatory: Responsible person authorized to compile the technical file (2006/42 Annex II § 2),
and empowered to draw up the declaration on behalf of the manufacturer (2006/42 Annex II § 10).
Name: Jean Bernard GIVET; **Function:** Chief Scientist.
Place and Date: JAY Electronique ZAC Bâtie Street Champrond 38334 St Ismier France on 17/09/2012

Signature : *signed on original*

351904A-revision03-Alto-Declarations_CE_de_conformite-FR_EN_DE.doc

12.6 Elio - CE Declaration of conformity

Translated from French

CE DECLARATION OF CONFORMITY

The manufacturer :

JAY Electronique
ZAC la Bâtie, rue Champrond
38334 ST ISMIER Cedex
FRANCE

Serial number of the product on original

Declares that the transceiver unit described in the user manual and mentioned here below:

ELIO

xxExxxxx

comply:

• With the requirements specified for the machines defined in Appendix I of the Directive 2006/42/EC concerning alignment of the legislation of the member states relative to machinery.

To this end, the notified body No. NB 0044 :

TÜV NORD CERT GmbH
Langemarckstraße 20
45141 Essen
Germany

has issued an EC type examination n° **44 205 11 382580 003** reflecting compliance with the following standards:

- EN ISO 13849-1 (2008) Requirements for performance level PL e (Category 4)
- EN ISO 13849-2 (2008) Validation
- EN 61508-1-7 (2010) Requirements for SIL 3
- EN 62061 (2005) Requirements for SIL 3
- EN 60204-1 (2007) paragraph 9.2.2 category 0.
- EN 13557+A2 (2008) paragraph 5.1 ; 5.2.3 and appendix C.
- EN ISO 13850 (2008) paragraph 4.1.4
- EN 60950-1 (2006)

This equipment can be used in applications up to Category 4 (PL e) according to EN ISO 13849-1 and SIL 3 according to EN 62061, for safety outputs. When combined with the appropriate operator module.

- With the requirements of the European Directives of the Council of Europe of March 9th 1999, concerning alignment of the legislations of the member states, relative to radio equipment and telecommunication terminals (**R&TTE 99/5/CE dated 9 March 1999**) with special reference to:
  - article 3.1a concerning the requirements relative to health and safety protection, with reference to standards EN 50371 (2001) and EN 50178 (1997).
  - article 3.1b concerning the requirements relative to protection with respect to electromagnetic compatibility, with reference to standards ETS EN 301 489/-1 (V1.6.1-2005) /-3 (V1.4.1-2001) ; EN 61000-6-2 (2005) ; EN 62061 (2005).
  - article 3.2, concerning the requirements relative to proper use of the radio frequency spectrum to prevent harmful interferences, with reference to standards EN 300 220-1 (V2.1.2).

To this end, the notified body n°0573:

AEMC Lab
19, rue François Blumet
ZI de l'Argentière
38330 SASSENAGE
FRANCE

Conducted testing of the above transceiver unit for Electromagnetic Compatibility (3.1b) and for compliance with the spectrum (3.2) included in the reports n° **R1110368C1-E**, and n° **R1110368R1-E**.

- With the requirements of the European Directive of the Council of 27 January 2003 on the restriction of use of certain hazardous substances in electrical and electronic equipment (RoHS) (2002/95/EC).
- With the requirements of the European Directive of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) Directive (2002/96/EC).

Signatory: Responsible person authorized to compile the technical file (2006/42 Annex II § 2), and empowered to draw up the declaration on behalf of the manufacturer (2006/42 Annex II § 10).
Name: Jean Bernard GIVET; **Function:** Chief Scientist.
Place and Date: JAY Electronique ZAC Bâtie Street Champrond 38334 St Ismier France on 17/09/2012

Signature : *signed on original*

351905A-revision02-Elio-Declarations_CE_de_conformite-FR_EN_DE.doc

12.7 Timo - CE Declaration of conformity

Translated from French

CE DECLARATION OF CONFORMITY

The manufacturer :

JAY Electronique
ZAC la Bâtie, rue Champrond
38334 ST ISMIER Cedex
FRANCE

Serial number of the product on original

Declares that the transceiver unit described in the user manual and mentioned here below:

TIMO

xxTxxxxx

comply:

• With the requirements specified for the machines defined in Appendix I of the Directive 2006/42/EC concerning alignment of the legislation of the member states relative to machinery.

To this end, the notified body No. NB 0044 :

TÜV NORD CERT GmbH
Langemarckstraße 20
45141 Essen
Germany

has issued an EC type examination n° **44 205 11 382580 007** reflecting compliance with the following standards:

- EN ISO 13849-1 (2008) Requirements for performance level PL e (Category 4)
- EN ISO 13849-2 (2008) Validation
- EN 61508-1-7 (2010) Requirements for SIL 3
- EN 62061 (2005) Requirements for SIL 3
- EN 60204-1 (2007) paragraph 9.2.2 category 0.
- EN 13557+A2 (2008) paragraph 5.1 ; 5.2.3 and appendix C.
- EN ISO 13850 (2008) paragraph 4.1.4
- EN 60950-1 (2006)

This equipment can be used in applications up to Category 4 (PL e) according to EN ISO 13849-1 and SIL 3 according to EN 62061, for safety outputs. When combined with the appropriate operator module.

- With the requirements of the European Directives of the Council of Europe of March 9th 1999, concerning alignment of the legislations of the member states, relative to radio equipment and telecommunication terminals (**R&TTE 99/5/CE dated 9 March 1999**) with special reference to:
  - article 3.1a concerning the requirements relative to health and safety protection, with reference to standards EN 50371 (2001) and EN 50178 (1997).
  - article 3.1b concerning the requirements relative to protection with respect to electromagnetic compatibility, with reference to standards ETS EN 301 489/-1 (V1.6.1-2005) /-3 (V1.4.1-2001) ; EN 61000-6-2 (2005) ; EN 62061 (2005).
  - article 3.2, concerning the requirements relative to proper use of the radio frequency spectrum to prevent harmful interferences, with reference to standards EN 300 220-1 (V2.1.2).

To this end, the notified body n°0573:

AEMC Lab
19, rue François Blumet
ZI de l'Argentière
38330 SASSENAGE
FRANCE

Conducted testing of the above transceiver unit for Electromagnetic Compatibility (3.1b) and for compliance with the spectrum (3.2) included in the reports n° **R1210351C1-E-A1 ; R1210351C2-E,** and **n° R1210351R-E-A1**.

- With the requirements of the European Directive of the Council of 27 January 2003 on the restriction of use of certain hazardous substances in electrical and electronic equipment (RoHS) (2002/95/EC).
- With the requirements of the European Directive of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) Directive (2002/96/EC).

Signatory: Responsible person authorized to compile the technical file (2006/42 Annex II § 2), and empowered to draw up the declaration on behalf of the manufacturer (2006/42 Annex II § 10).
Name: Jean Bernard GIVET; **Function:** Chief Scientist.
Place and Date: JAY Electronique ZAC Bâtie Street Champrond 38334 St Ismier France on 07/12/2012

Signature : *signed on original*

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NOTES :

13 «Help us improve this manual» form

Formulaire d'aide à l'amélioration de ce manuel
«Help us improve this manual» form
Formular für Verbesserungsvorschläge für dieses Handbuch

Améliorons ensemble ce manuel d'installation et d'utilisation !

We can improve this manual with your assistance !

Helfen Sie uns bei der Verbesserung des Installations- und Benutzerhandbuchs !

Informations personnelles / Personal information / Persönliche Angaben:

Nom Name	
Société Company Gesellschaft	
Adresse Address	
Ville City Stadt	
Code postal Post code Postleitzahl	
Tel	
Fax	
E-mail	

(avec n° page / with page nb / mit Seite Nr)

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JAY Electronique
Service documentation - Eric DECHAME **Fax : +33.(0)4.76.41.44.44**
ZAC la Bâtie, rue Champrond
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«MERCI ! / THANKS ! / DANKE !»

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